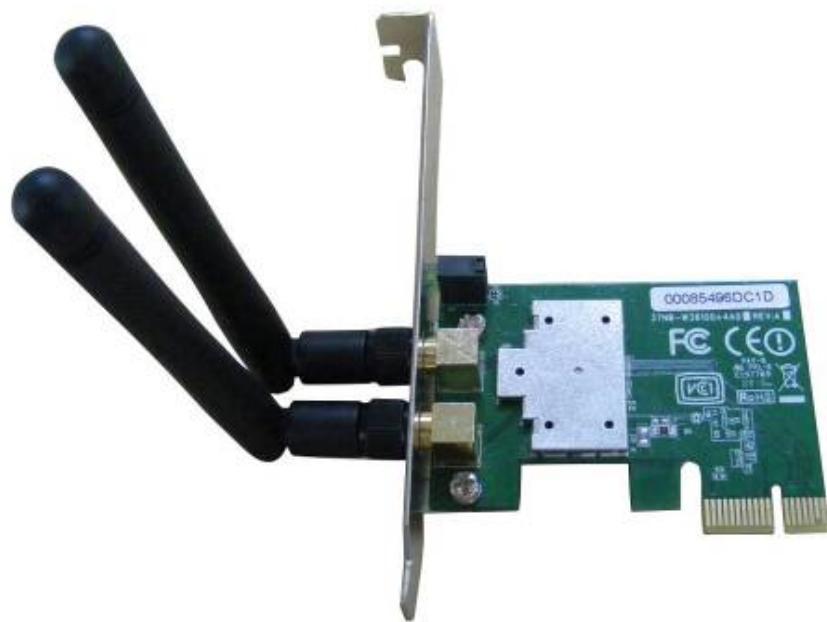


# IEEE 802.11n Wireless Series

## **Wireless 1T2R PCI-E Card**



# **User Manual**

Version: 2.2, March 10, 2010.

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## FCC Certifications



### Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

### IMPORTANT NOTE:

#### FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IEEE 802.11b/g or 802.11n operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

## CE Mark Warning



This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022 Class B for ITE, the essential protection requirement of Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility and R&TTE Directive 1999/5/EC to meet the regulation of the radio equipment and telecommunications terminal equipment.

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低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

## Package Contents

The following contents should be found in your box:

- One IEEE 802.11n 1T2R PCI-E Card
- Two antennas
- One resource CD, including:
  - ❖ REALTEK 11n PCI-E Wireless LAN Driver and Utility
  - ❖ User's Manual
  - ❖ QIG

### **Note:**

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact with your distributor.

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## Chapter 1 Introduction

Thank you for purchasing this product. Read this chapter to know about your IEEE 802.11n wireless 1T2R PCI-E Adapter.

### 1.1 Overview of the product

#### Comply with 802.11n Standards

The IEEE 802.11n Wireless PCI-E adapter provides users to launch IEEE 802.11n wireless network at 300 Mbps in the 2.4GHz band. It can also interoperate with all 11Mbps wireless (802.11b) products and all 54 Mbps wireless (802.11g) products.

#### Reliable Coverage and Connection

The PCI-E Card adopts MIMO has two external detachable omni directional antennas providing even better wireless performance, transmission rates, stability and coverage. You can configure this adapter with ad-hoc mode to connect to other 2.4 GHz wireless computers, or with infrastructure mode to connect to a wireless AP or wireless router for accessing to Internet.

#### Easy Installation, enhanced Wireless Security

As for installation, this wireless PCI-E adapter provides you the flexibility to install your PC in the most convenient location available, without the cost of running network cables. So you can easily connect your PC to your Wireless Access Point and enjoy the pleasure of Wi-Fi. Also, this product supports WPA / WPA2 encryptions and mechanisms, allowing users to quickly and easily configure wireless security.

### 1.2 Features

- High Speed transfer data rate up to 300 Mbps
- Support QoS Enhancement ( WMM, WMM-PS Client mode)
- Supports wireless data encryption with 64/128-bit WPA,WPA2
- Support frame aggregation, Power saving mechanism, channel management and co-existence
- Transmit Opportunity (TXOP) Short Inter-Frame Space (SIFS) bursting for higher multimedia bandwidth
- Supports auto-installation and diagnostic utilities
- Two 802.11n/b/g wireless SMA antennas (Standard 1.8dB)
- Supports driver for Windows 7, XP 86, XP 64, Vista 86, Vista 64, Linux

## 1.3 Application Diagram



## 1.4 LED Status

LED Indications	Status	Working Status
Link LED	Off	The adapter is Radio off
	Blink green	The adapter is already connected
Act LED	Blink green and flashing intermittently	The adapter is already connected but is not transmitting or receiving data
	Blink green and fast flashing	The adapter is activity and transmitting or receiving data.
	Off	The adapter is Radio off

## Chapter 2 Installation Guide for Windows

### 2.1 Hardware Installation

1. Make sure the computer is turned off. Remove the expansion slot cover from the computer.
2. Carefully slide the Wireless 1T2R PCI-E Card into the PCI-E slot. Push evenly and slowly and ensure it is properly seated.
3. Secure the antennas on.
4. Turn on your computer. Windows detects the new hardware automatically.

### 2.2 Software Installation

#### 2.2.1 Overview

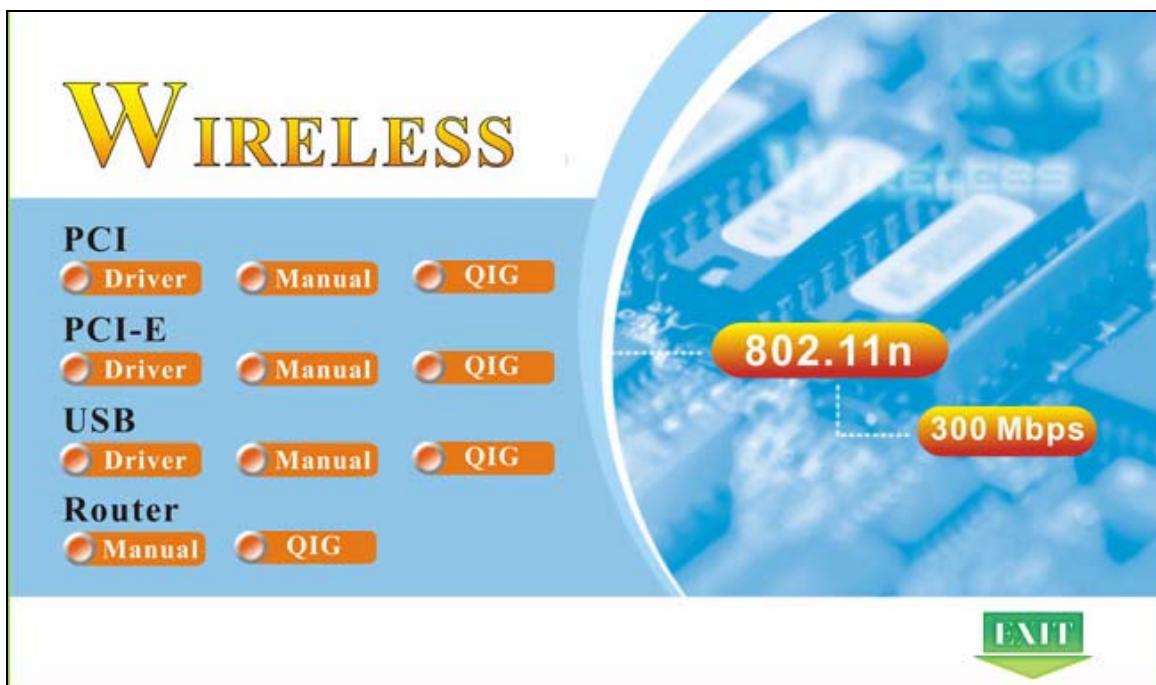
The following driver installation guide uses Windows XP as the presumed operation system.

1. The system finds the newly installed device automatically. Click **Cancel** to close this window.

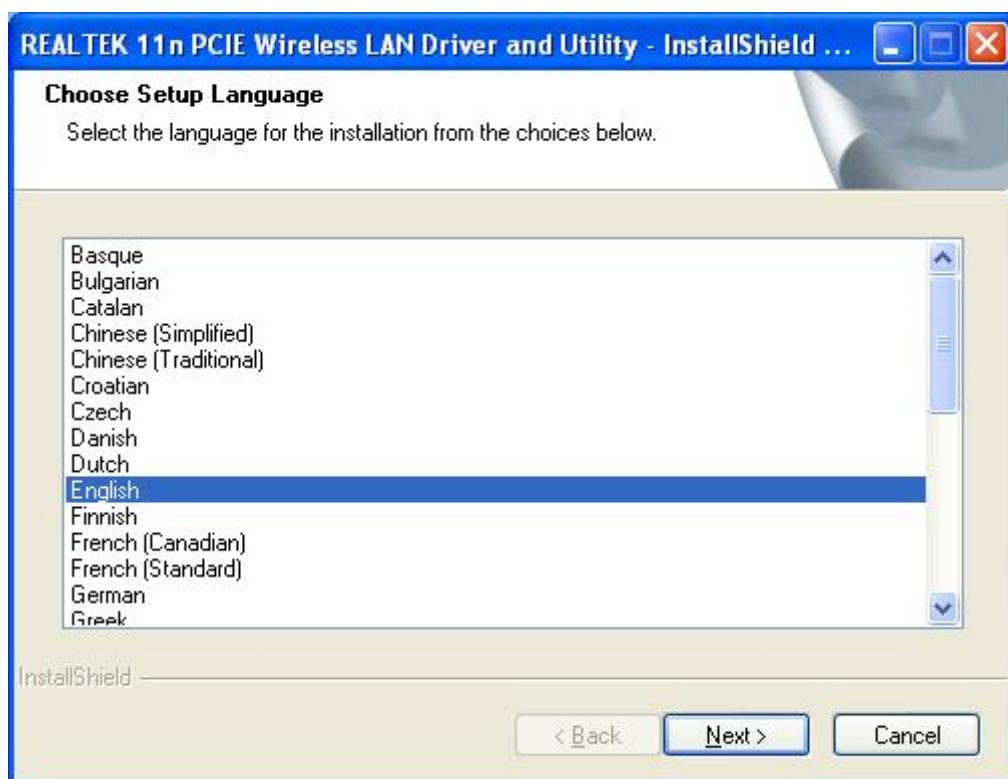


#### 2.2.2 Software Installation

1. Insert the CD into your CD-Rom, and then appear an interface. Please click on **PCI-E> Driver> Win** to start the installation.



2. The language-selecting window pops up. Please select the language you use and click "Next".

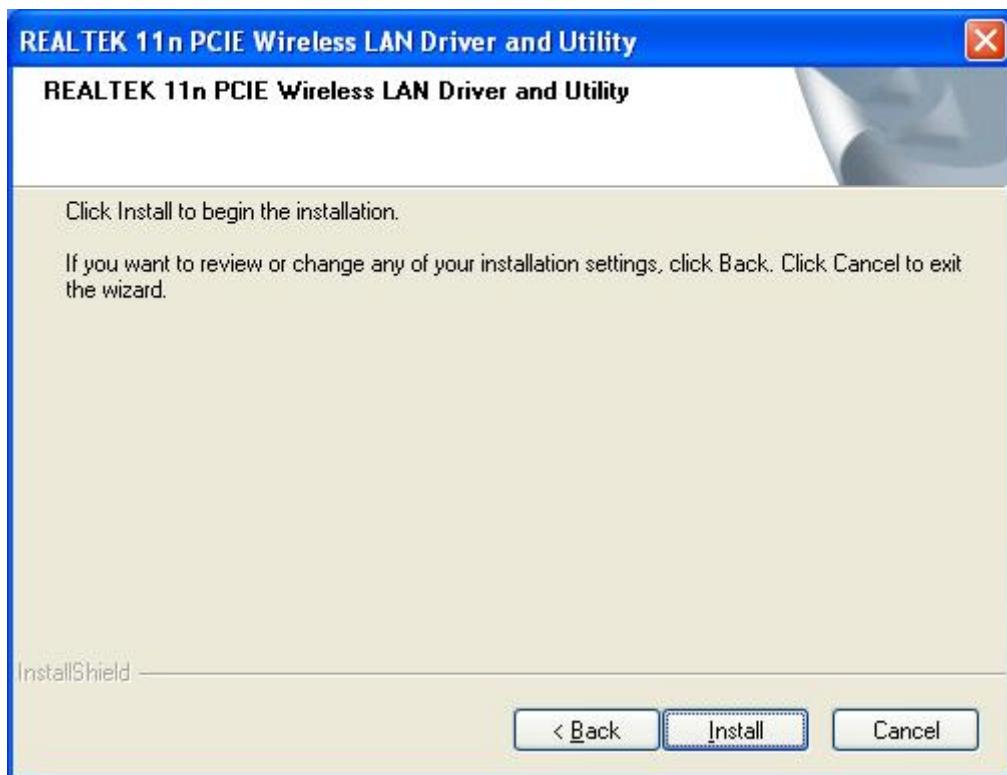


3. The welcome window pops up. Click the "Next" button to proceed.

# Wireless 11n 1T2R PCI-E Card

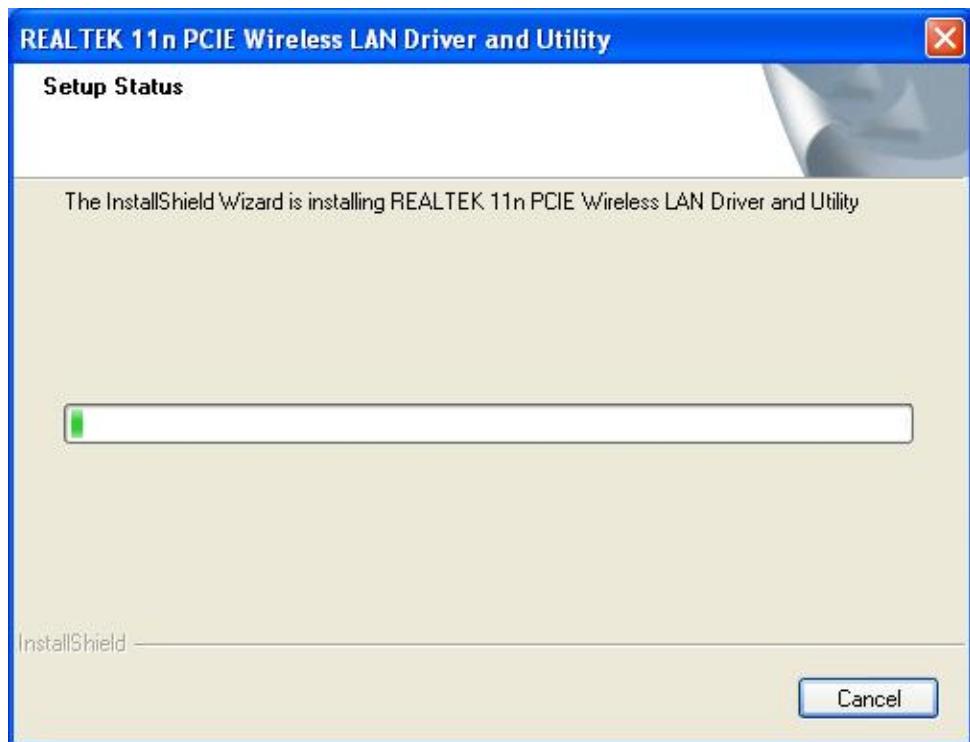


4. Click the "Install" button to start installing.



5. Please wait while installation.

# Wireless 11n 1T2R PCI-E Card



6. Please wait again while installation



7. After all the steps above, you will see the screen below, click **Finish** to reboot the system.



## Chapter 3 Management Guide

This chapter describes how to configure your Adapter for wireless connectivity on your Wireless Local Area Network (WLAN) and use the data security encryption features.

After Installing the Adapter, the Adapter's tray icon will appear in your system tray. It appears at the bottom of the screen, and shows the signal strength using color and the received signal strength indication (RSSI).

-  If the icon is purple, there is no connection.
-  If the icon is white, the network is dropping off.
-  If the icon is green, there is good signal strength.
-  If the icon is green, there is excellent signal strength.

### 3.1 Making a Basic Network Connection

#### 3.1.1 Select a configuration tool

In the following instruction for making a network connection, we use the provided Utility to configure your wireless network settings.

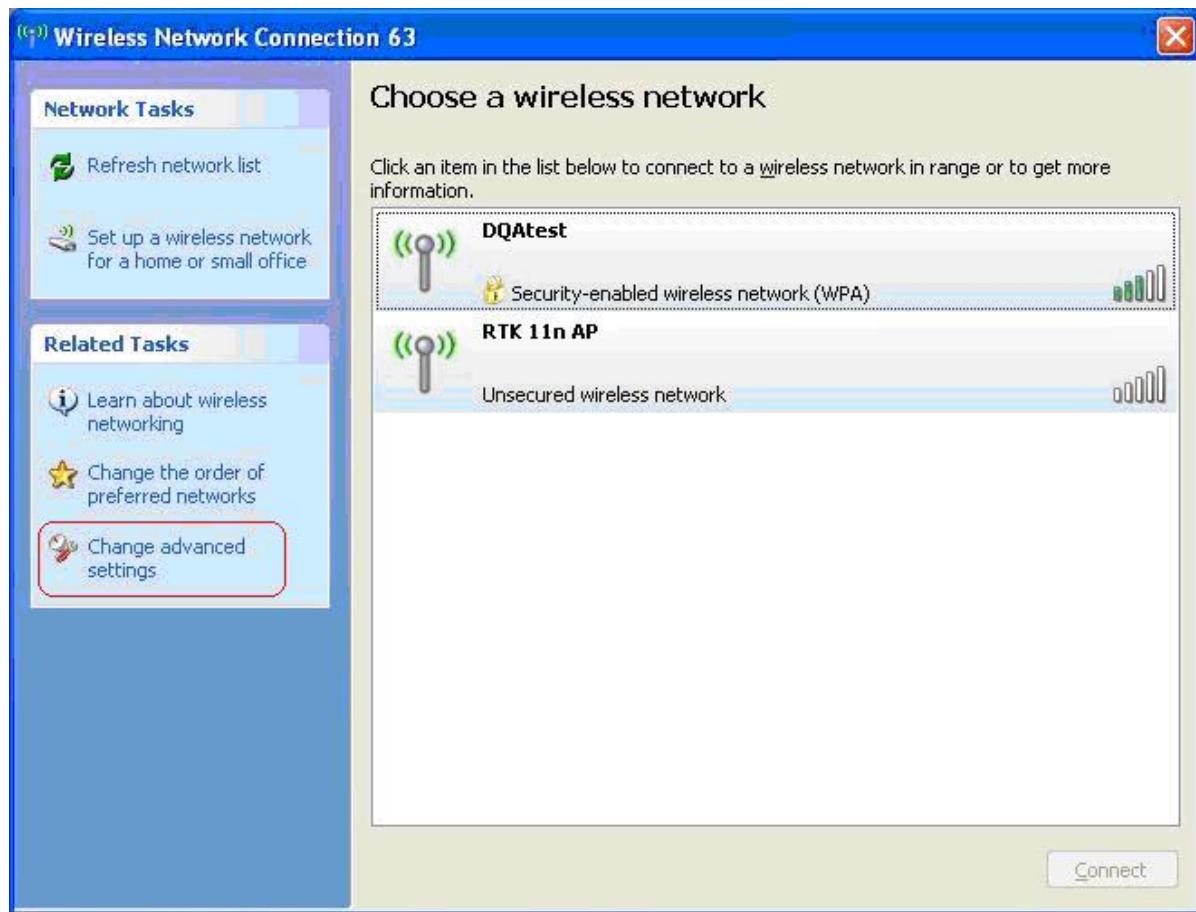
**Note:** You could use either the software we provide or Microsoft Zero Configuration tool to configure this adapter.

#### 3.1.2 To connect with Microsoft Zero Configuration tool

After specifying the Microsoft Zero Configuration tool to configure your wireless network, right click on the  icon on system tray. Select “View Available Wireless Networks” to specify your wireless network.



The tool shows the available wireless networks. Select your demanding network to connect with. To connect to a wireless network, please click **Change advanced settings** to be compatible with your wireless network settings.



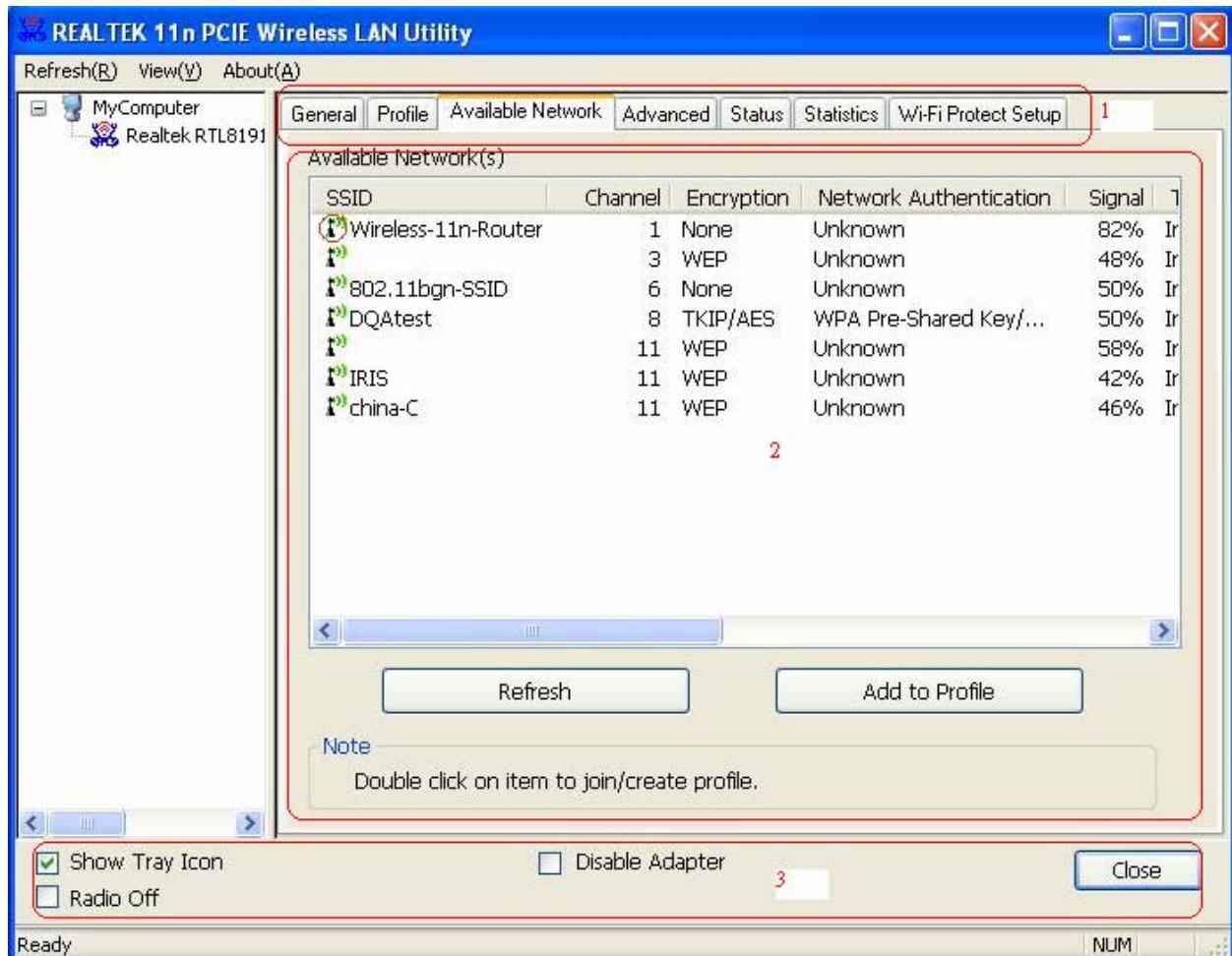
### 3.1.3 To connect with 802.11n Wireless LAN Utility

We provide this Utility for users to connect to a wireless network easily. It provides more information and configuration for this adapter. As default, the Utility is started automatically upon starting your computer and connects to a connectable wireless network with best signal strength and with no security setting. Right click on the icon  in the system tray and select **Open Config utility** if the Utility does not start. Please refer to the following chapters to get information regarding to the functions of this Utility.

## 3.2 Introduction to the 802.11n Wireless LAN Utility

**Note:** The Utility in Linux and Mac are different from the following.

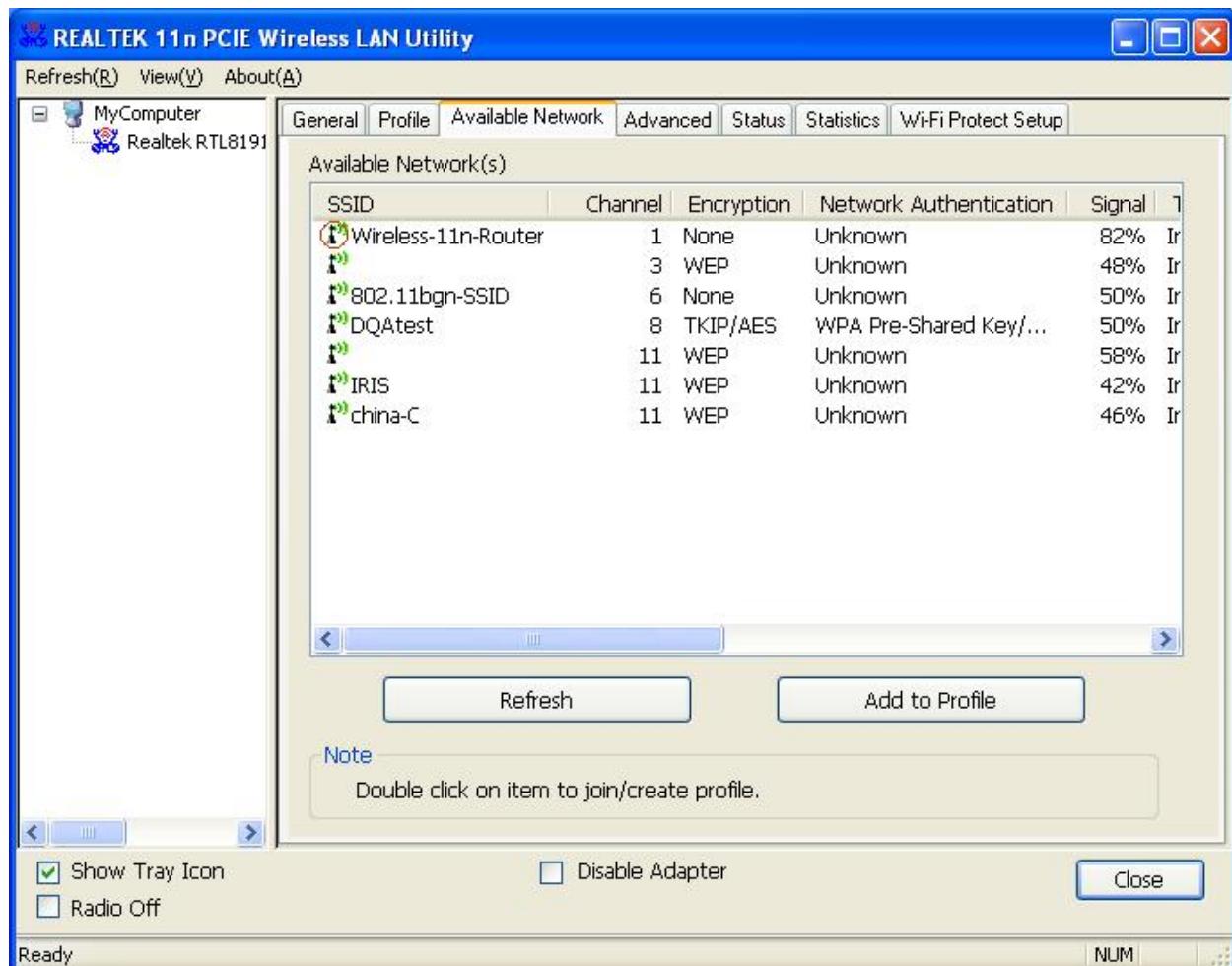
### 3.2.1 Interfaces



- Functional Buttons:** on top of the window. You can click each button to access each configuration window.
- Configuration Column:** Center of the Utility window. Make your changes for each function in this part.
- Optional Table:** "Show Tray Icon", "Disable Adapter", "Radio off"

### 3.2.2 Available Network

This network lists the available wireless networks. The Utility connects to a wireless network with best signal strength automatically. You can refresh the connecting network by clicking on the network name and click the **Refresh** button. In the center of the Utility windows, you will see detail information of each network.



## Available Network Information:

Items	Information
<b>SSID</b>	The name of the IEEE 802.11 wireless network. This field has a maximum limit of 32 characters.
<b>Channel</b>	Display current channel in use.
<b>Encryption</b>	Shows the encryption mode in use. There are total 4 modes: None, WEP, TKIP and AES.
<b>Network Authentication</b>	Shows the authentication mode in use.
<b>Signal</b>	This percentage shows the strength of the signal.
<b>Type</b>	<p>The type of network and the station currently connected are shown here. The options include :</p> <ul style="list-style-type: none"> <li>• <b>Infrastructure</b> - All wireless clients will connect to an access point or wireless router.</li> <li>• <b>Ad-Hoc</b> - Directly connecting to another computer, for</li> </ul>

	peer-to-peer communication, using wireless network adapters on each computer, such as two or more wireless adapters.
<b>BSSID</b>	The IEEE MAC address of locally-managed, generating from a 46 random code.
<b>Support Rates</b>	Show current rate

**Note:**

- 1) An **Infrastructure network** contains an Access Point or wireless router. All the wireless devices or clients will connect to the wireless router or access point.
- 2) An **Ad-Hoc network** contains only clients, such as laptops with wireless desktop adapters. All the adapters must be in Ad-Hoc mode to communicate.

### 3.2.3 Profile

1. Add a new profile:

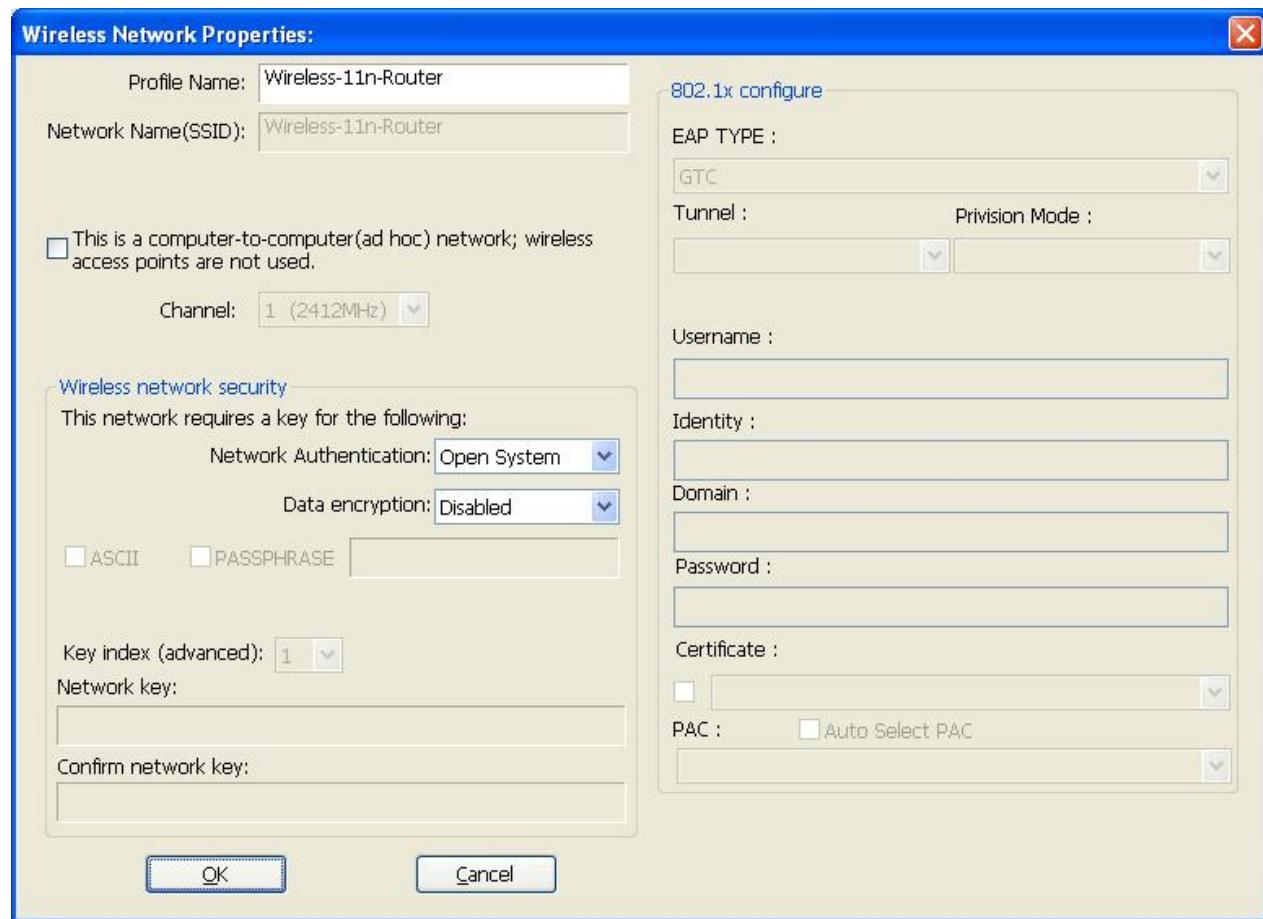
(1) Selecting an available network in the “**Available Network**” function then click the **Add to Profile** button., or double click the network name. You could also add a new profile quickly by clicking the **Add** button in the “**Profile**” function.

**Note:** If the network you add to profile is not encrypted, “Unsecured network” window will pop up, then Click “OK”.



(2) It displays “Wireless Network Properties” dialog box. This profile page allows users to save different wireless settings, which helps users to get access to wireless networks at home, office or other wireless network environments quickly.

# Wireless 11n 1T2R PCI-E Card



In this dialog box, there are some items:

Items	Information
<b>Profile Name</b>	Identifies the configuration profile .This name must be unique. Note that the profile names are not case-sensitive.
<b>Network Name(SSID)</b>	The IEEE 802.11n wireless network name, using default name defined by system. This field has a maximum limit of 32 characters.

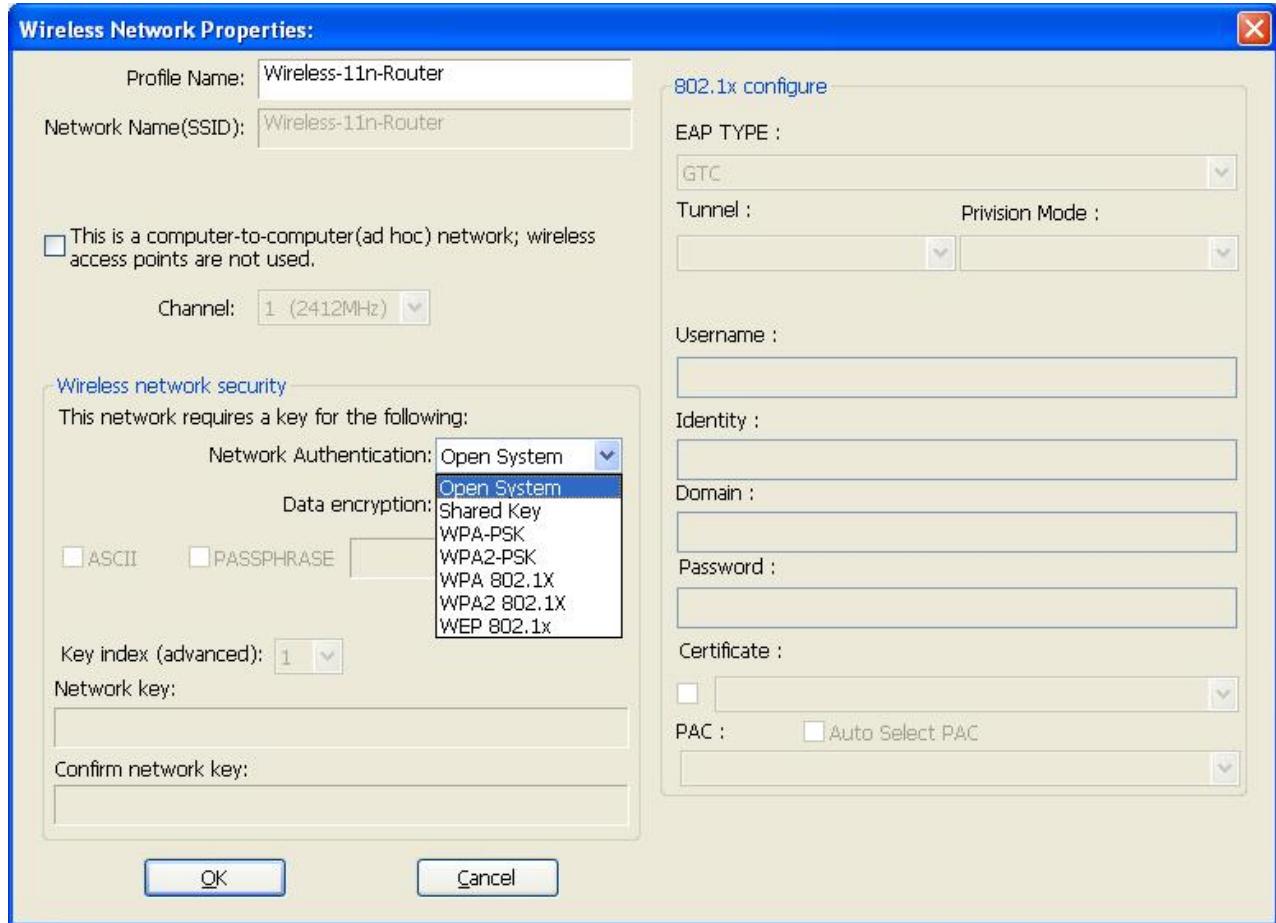
(3) Channel (Country Region Code): seven countries to choose. Country channel list:

Country	Channel Range	Country	Channel Range
USA	CH1 ~ CH11	FRANCE	CH10 ~ CH13
CANADA	CH1 ~ CH11	JAPAN	CH1 ~ CH14
ETSI	CH1 ~ CH13	ISRAEL	CH1 ~ CH13
SPAIN	CH10 ~ CH11		

## (4) Wireless Network Security

### A. Network Authentication

There are 7 types supported: Open System, Shared Key, WPA-PSK, WPA2-PSK, and WPA 802.1X, WPA2 802.1X, WEP 802.1X. Please select a type from the drop down list.



- **Open System:** enable an adapter to attempt authentication regardless of its WEP settings. It will only associate with the access point if the WEP keys on both the adapter and the access point match.
- **Shared-key:** only allows the adapter to associate with access points that have the same WEP key.
- **802.1x:** This item appears while the environment is set to an open authentication with WEP encryption. The section is also available in WPA and WPA2 authentication types.
- **Preshared Key (PSK):** This is the shared secret between AP and STA. For WPA-PSK, WPA2-PSK and WPA-NONE authentication mode, this field must be filled with characters longer than 8 and less than 32 lengths. The following dialog appears if you have input invalid values.
- **WEP Key:** Only available when using WEP encryption algorithm. The key must match AP's key. Only using the same cryptographic key to access the computer, the internet can storage, and decryption the information from other computer.

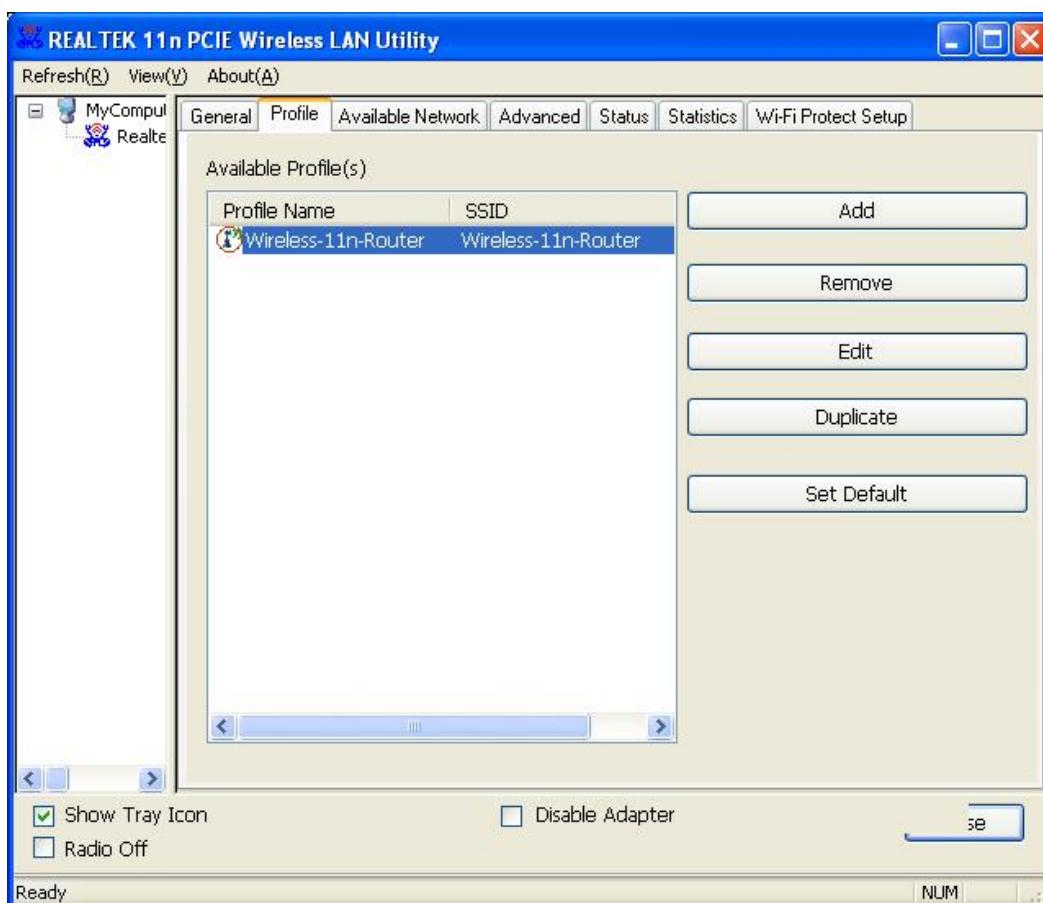
## B. Data Encryption:

<b>Data encryption</b>	There are 4 types supported: Disabled, WEP, TKIP and AES. The available encryption selection will differ from the authentication type you have chosen, the result is shown below:	
	<b>Authentication</b>	<b>Available Encryption Selection</b>
	Open System	Disabled, WEP
	Shared Key , WEP 802.1X	WEP
	WPA-PSK, WPA2-PSK, and WPA 802.1X, WPA2 802.1X	TKIP, AES

**Note:** Select different Security Options, the configurations are different; you can select the appropriate security option and configure the exact key as your need.

- **TKIP:** "Temporary Key Integration communication Protocol", it provide each packet's key mixture, message integration and key reconstruction mechanism. TKIP can use with personal or the enterprise network validation.
- **AES:** "Advanced Encryption Standard", it is a new method that the wireless transmission of privacy protection. AES encryption methods provides more careful than TKIP.

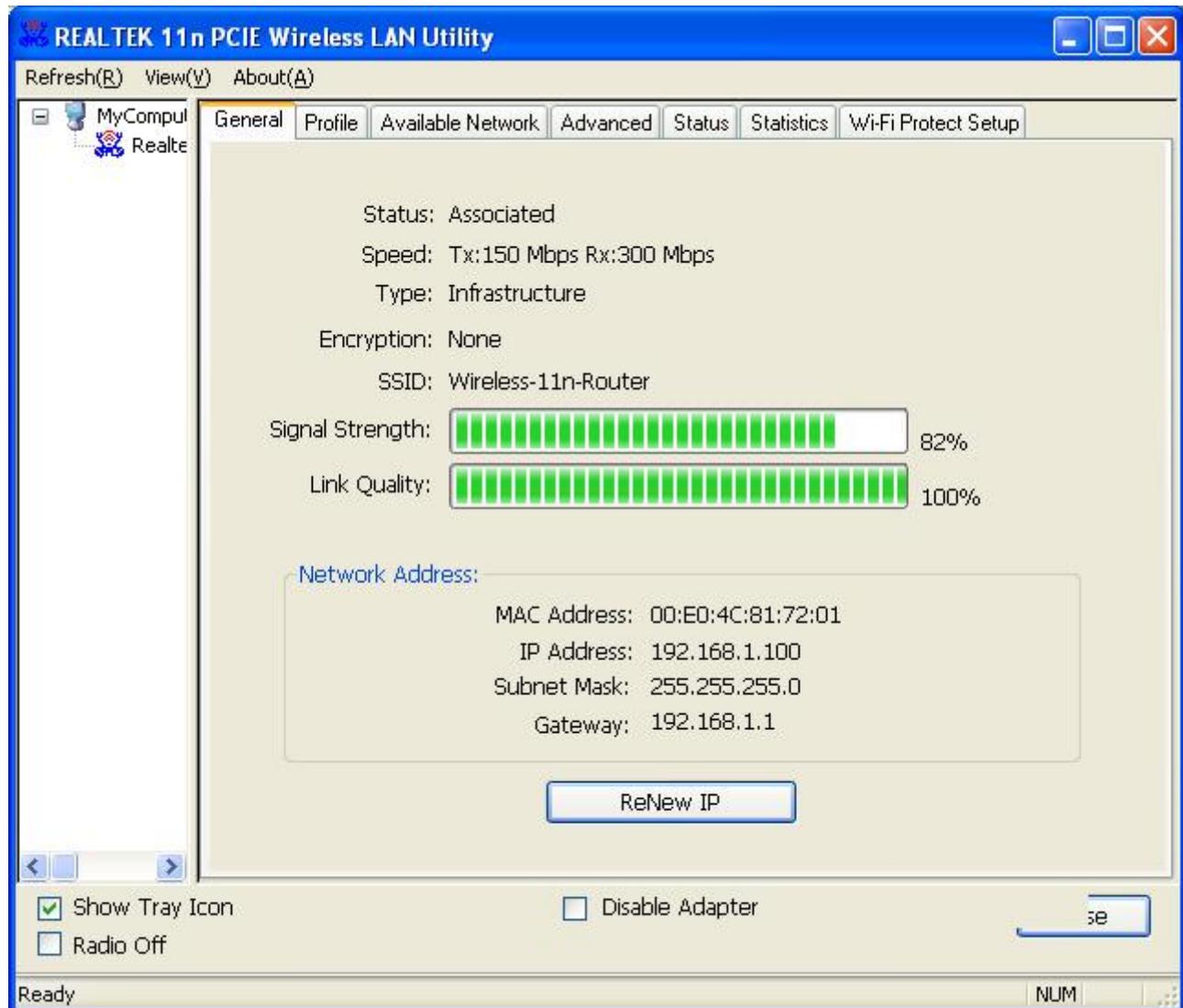
(5) Finish the configuration, then click "OK", that network has been added to the profile.



**Profile List:** The list shows all the profiles you have added before.

**Buttons:** You can click on these buttons to **Add** a new profile, **Remove**, **Edit**, **Duplicate** or **Set Default** an old profile.

### 3.2.4 General



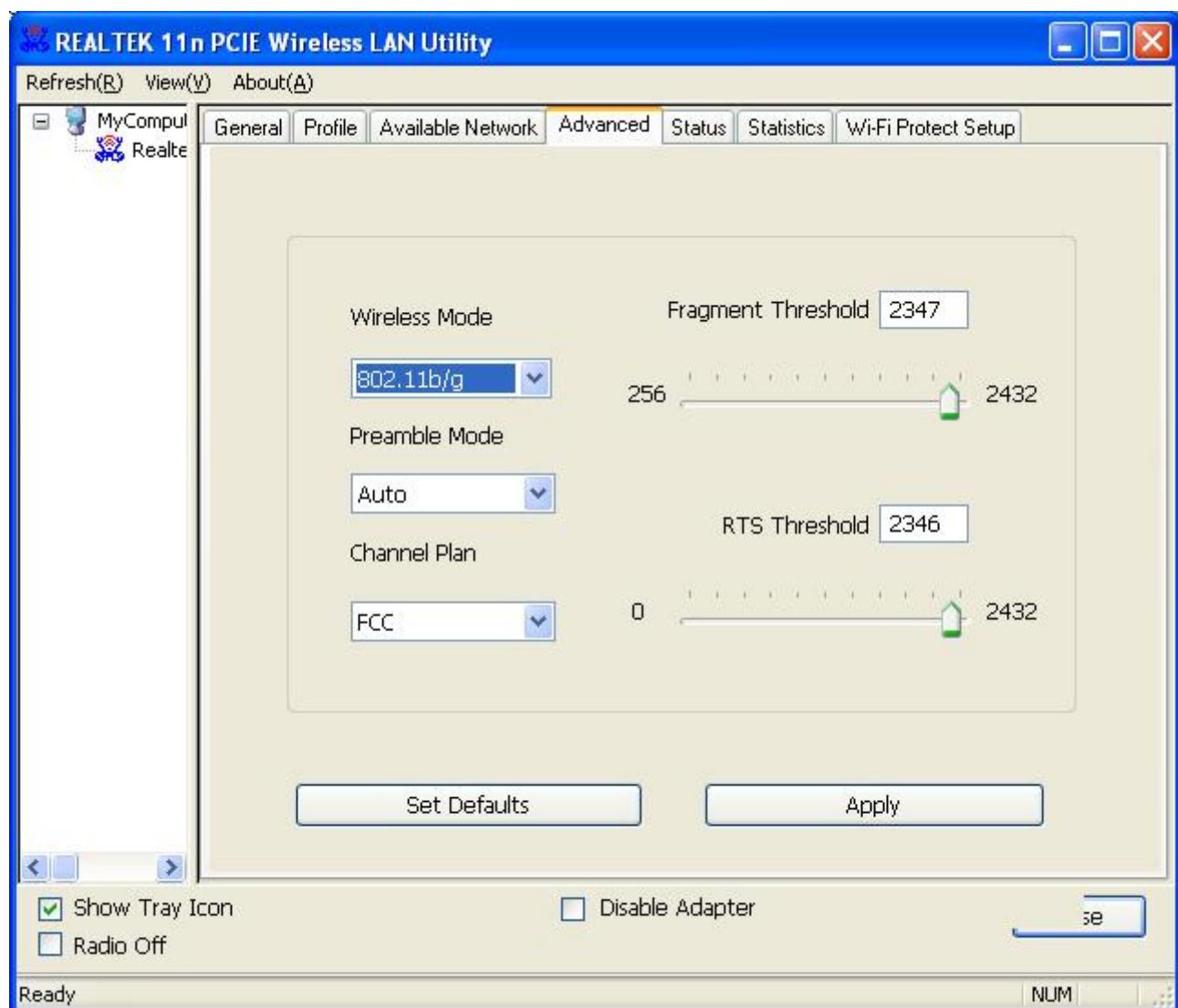
In this window, there are some items as following:

Items	Information
<b>Status</b>	Currently connection status
<b>Speed</b>	Show current transmit rate and receive rate
<b>Type</b>	Network type in use
<b>Encryption</b>	Encryption type in use
<b>SSID</b>	The name of the IEEE 802.11 wireless network. This field has a maximum limit of 32 characters

<b>Signal Strength</b>	Receive signal strength
<b>Link Quality</b>	Display connection quality based on signal strength
<b>Network Address</b>	<ul style="list-style-type: none"> <li>A. MAC Address : The MAC address of the wireless network adapter.</li> <li>B. IP Address : IP address of current connection.</li> <li>C. Subnet Mask : Subnet mask of current connection.</li> <li>D. Gateway : Gateway of current connection.</li> </ul>

### 3.2.5 Advanced

This screen below allows you to make advanced configuration for the profile. Please refer to the following chart for definitions of each item.



#### 1. Preamble Mode

The length of CRC blocks in the frames during the wireless communication. Select the options from the drop list : (1) Long (2)Short (3)Auto.

## 2. Channel Plan

The selected Country: FCC, IC, ETSI, Spain, France, MKK, MKK1, Israel, TELEC, Default

## 3. Threshold

### (1) Fragment Threshold

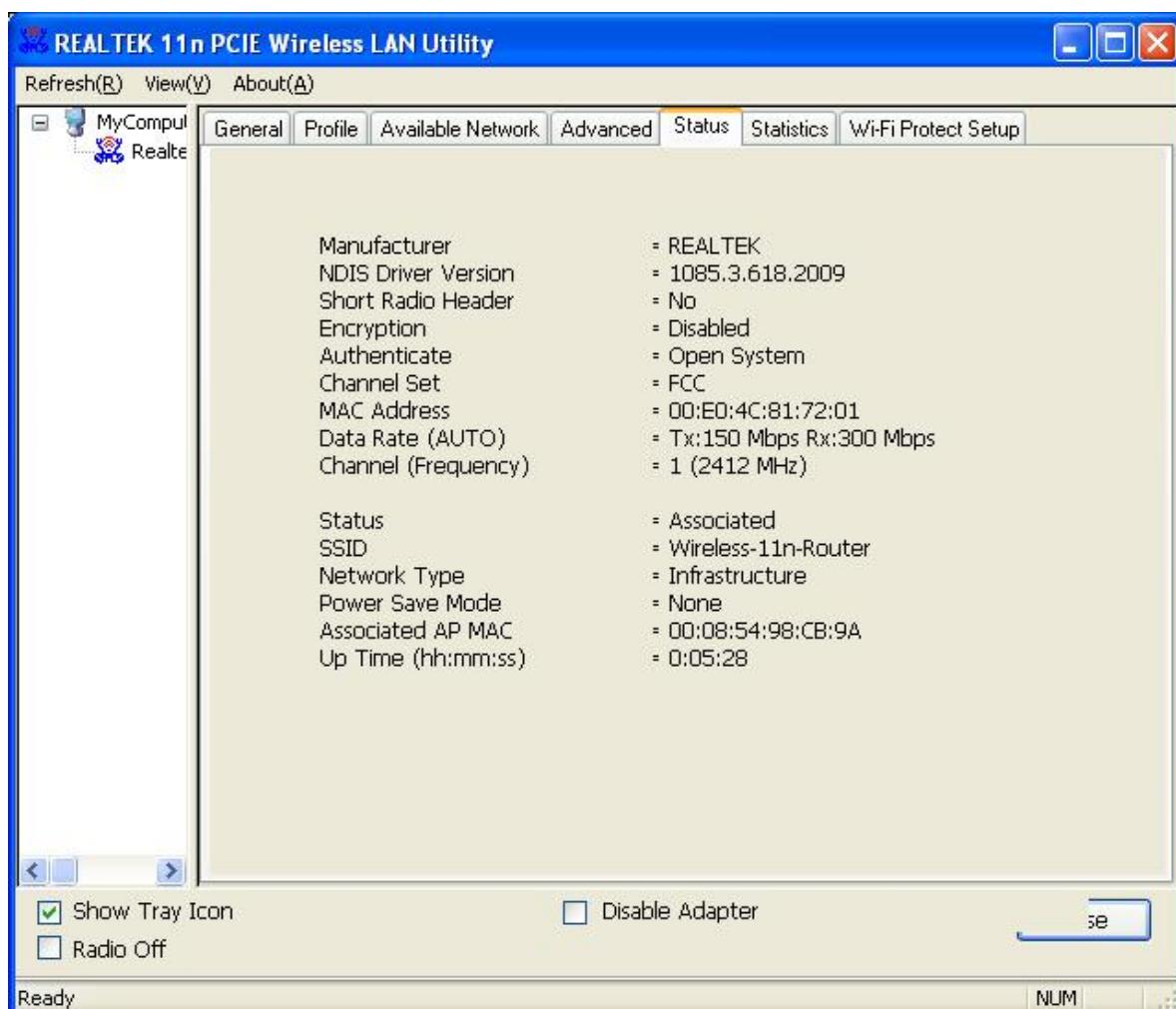
This value should remain at its default setting of 2347. If you experience a high packet error rate, you may slightly increase your fragmentation threshold within the value range of 256 to 2432. Setting the fragmentation threshold too low may result in poor performance.

### (2) RTS Threshold

Request To Send threshold. This value should remain at its default setting of 2346. If you encounter inconsistent data flow, only minor modifications to the value range between 0 and 2432 are recommended.

### 3.2.6 Status

The Status tab contains general information about the program and its operations. The current Status tab needn't any configurations.



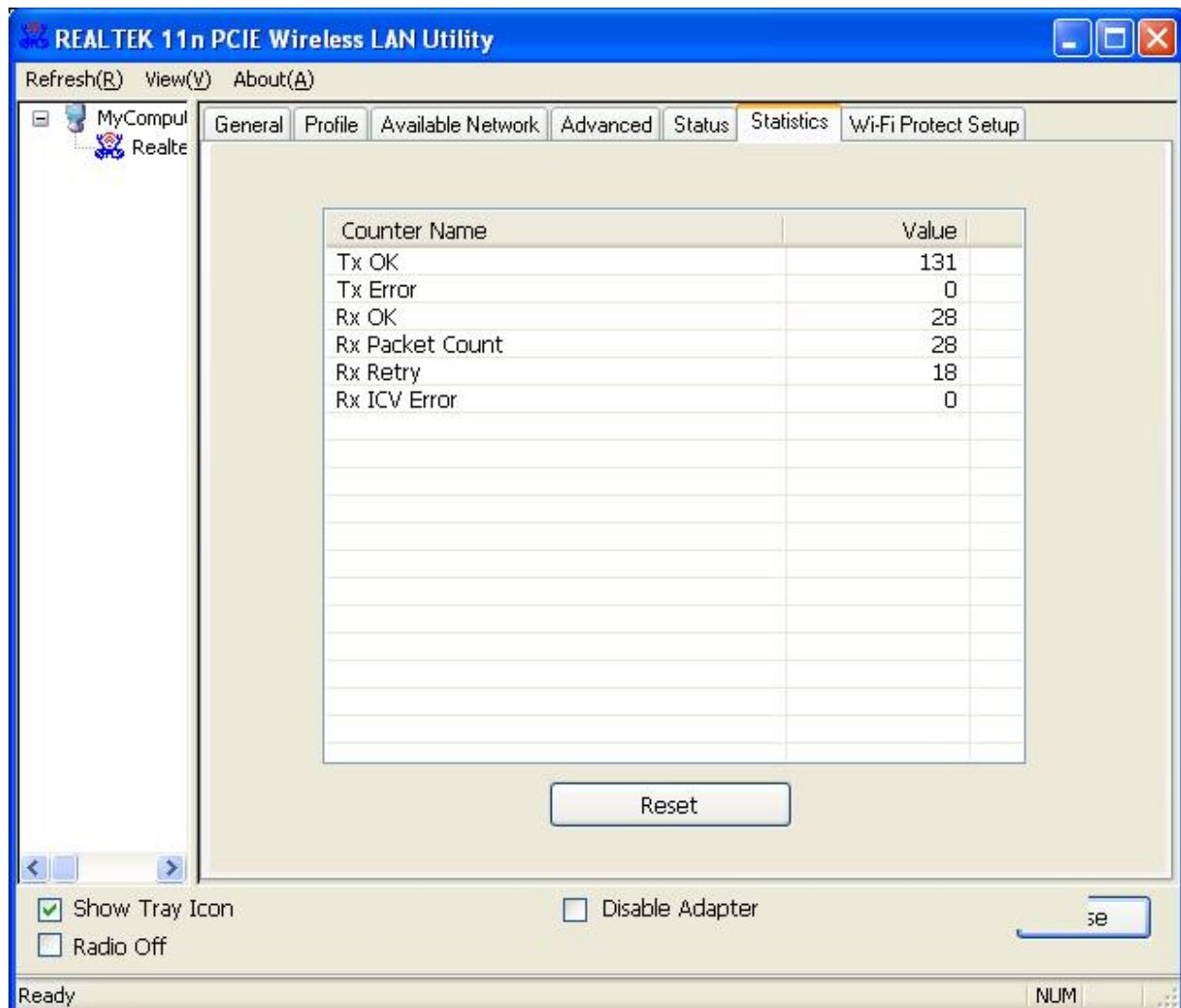
The following table describes the items found on the Status screen.

Items	Information
<b>Manufacturer</b>	The name of manufacturing this product
<b>NDIS Driver Version</b>	The version of Network Driver Interface Specification
<b>Encryption</b>	Here displays the encryption type the device is using
<b>Authenticate</b>	This shows whether the server based authentication is used.
<b>Channel Set</b>	Appears the Channel you use
<b>MAC Address</b>	The MAC address of the wireless network adapter.
<b>Data Rate(Auto)</b>	Show current transmit rate and receive rate
<b>Channel Frequency</b>	Shows the channel in use (1~14)
<b>Status</b>	Current connection status
<b>SSID</b>	The SSID of the wireless system.
<b>Network Type</b>	The type of network and the station currently connected are shown here. The options include : Infrastructure, Ad Hoc
<b>Power Save Mode</b>	<p>The power save mode have three mode, as follows :</p> <ul style="list-style-type: none"> <li><b>Max</b> - Selects maximum mode to let the access point buffer incoming messages for the Adapter. The Adapter will detect the access point if any messages are waiting periodically.</li> <li><b>Min</b> - Min mode uses minimum when retrieving a large number of packets, then switches back to power save mode after retrieving the packets.</li> <li><b>None</b> - Turns power saving off, thus powering up the Wireless PCI-E Adapter continuously for a short message response time.</li> </ul>
<b>Associated AP MAC</b>	The MAC Address of associated AP
<b>Up Time</b>	Record life time

### 3.2.7 Statistics

Statistics page displays the detail counter information based on 802.11 MIB counters. This page translates the MIB counters into a format easier for user to understand. It show receiving and transmitting statistical information about the following receiving and transmitting diagnostics for frames received by or transmitted to the wireless network adapter.

# Wireless 11n 1T2R PCI-E Card



Items	Information
<b>TX OK</b>	Successfully transmitted frames numbers.
<b>TX Error</b>	Frames numbers transmitting with error.
<b>RX OK</b>	Successfully received frames numbers.
<b>Rx Packet Count</b>	The packets of receiving frames
<b>RX Retry</b>	Frames numbers re-receiving
<b>RX ICV Error</b>	Integrity Check Value receiving with error.
<b>Reset Counter</b>	Reset counters to zero.

### 3.2.8 Wi-Fi Protect Setup

The primary goal of Wi-Fi Protected Setup (Wi-Fi Simple Configuration) is to simplify the security setup and management of Wi-Fi networks. This adapter supports the configuration setup using PIN configuration method or PBC configuration method. If the wireless card supports Wi-Fi Protected Setup (WPS), you can establish a wireless connection between wireless card and router using either Push Button Configuration (PBC) method or PIN method.

Here we will introduce two ways to configure the QSS

(QSS is known as rapid security settings, by pressing the wireless router and wireless card on the QSS button to automatically set up WPA2 secure connection level without the router or network adapter management software to conduct the cumbersome interface settings, greatly simplifying the operation of the wireless security settings.)

**Pin Code:** 8-digit numbers. It is randomly generated from system

#### 1. PIN method

Click the button “Pin Input Config (PIN)”, and then come to the following figure.



Click the button “Yes”, you can select one of the AP.



In this figure, you can operate these buttons “Refresh / Select / Cancel”. Select the name of one AP, then click “Select” button, you could use PIN method to configure the QSS.

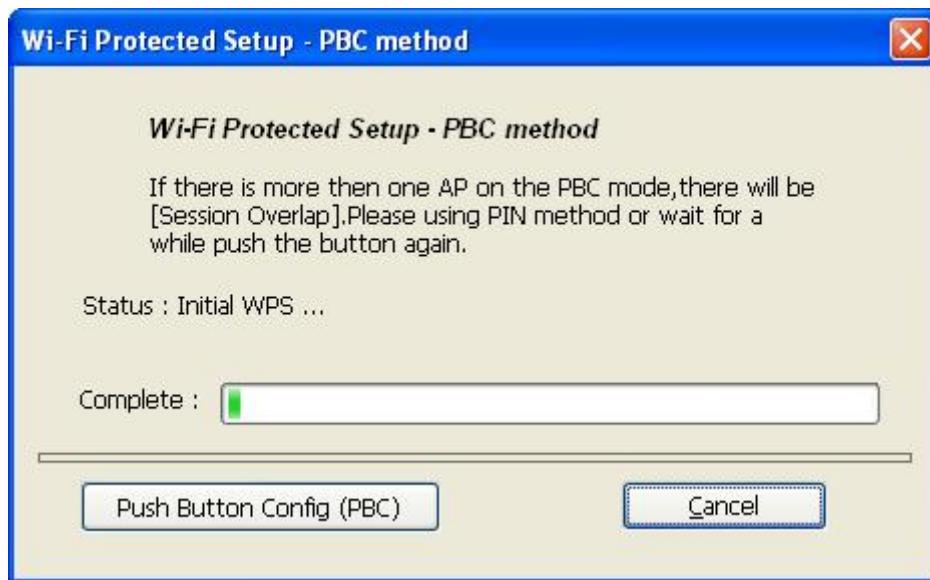


Double click the Internet WEB browser icon on your desktop screen. Type the IP address of you selected router/AP into the URL and press Enter, and then you can enter the configuration.

Please enter the WPS ( Wi-Fi ) configuration page, type the PIN code of adapter and click confirm button to build WPS connection. WPS connection will be successful by PIN method after several minutes.

## 2. PBC (Push Button Configuration) method

After pushing the PBC button, please push the physical button on your AP or visual button on the WPS config page, then come to the following figure.



Please enter the WPS ( Wi-Fi ) configuration page of your desired router/AP, and then start PBC connection. WPS connection will be successful by PBC method after several minutes.

## Chapter 4 Introduction for Vista User

### 4.1 Installation

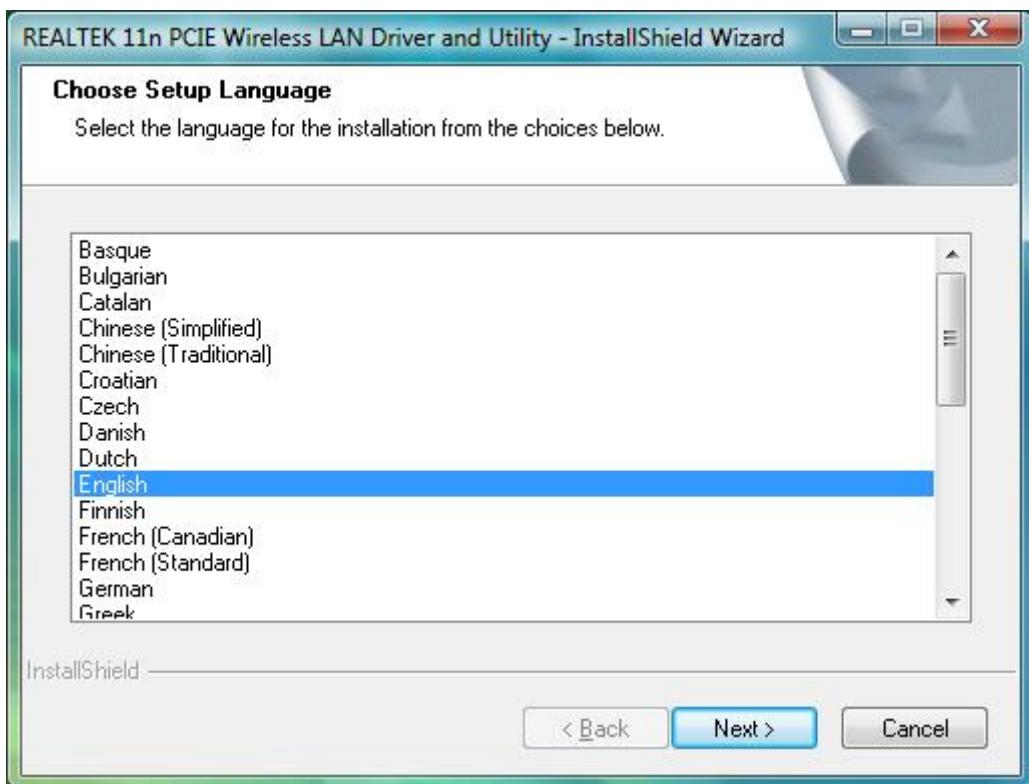
#### 4.1.1 Overview

The Adapter's Setup Wizard will guide you through the Installation procedure for Vista. The Setup Wizard will install the REALTEK 11n PCI-E Wireless LAN Driver and Utility. When you install the hardware prior to before installing the software, the system will prompt "Found New Hardware Wizard", click **Cancel**, and run the Setup Wizard program on the CD-ROM.

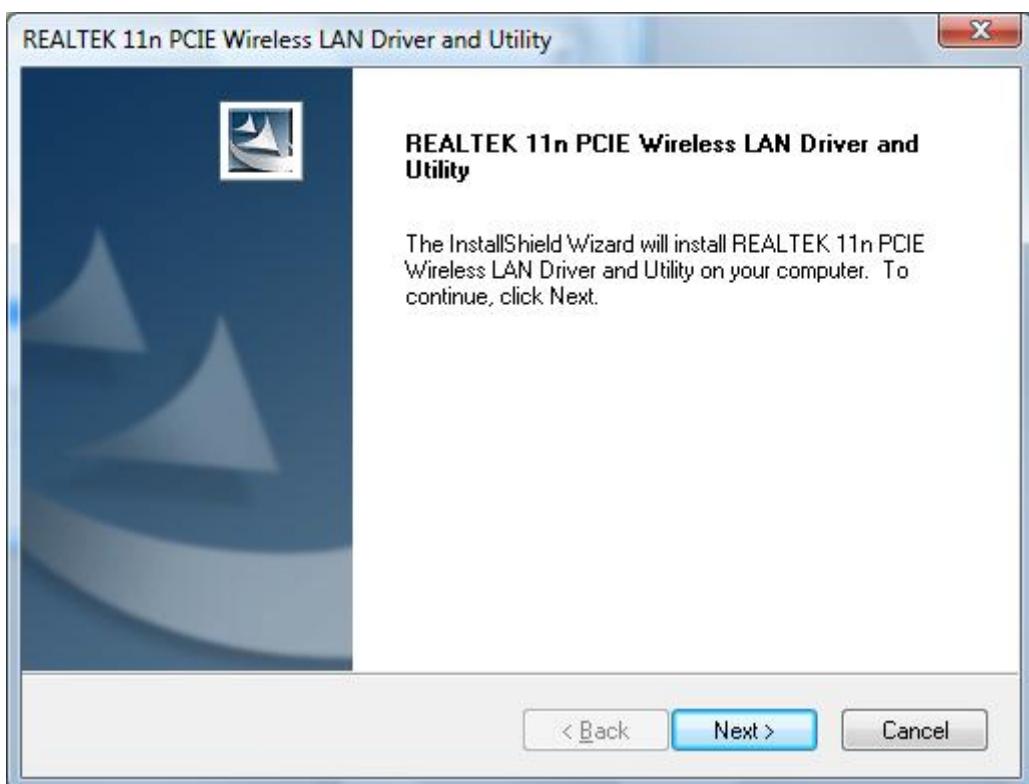


#### 4.1.2 Software Installation for vista

1. Insert the CD into your CD-Rom, and then appear an interface. Please click on **PCI-E> Driver> Win** to start the installation.
2. The language-selecting window pops up. Please select the language you use and click "Next".

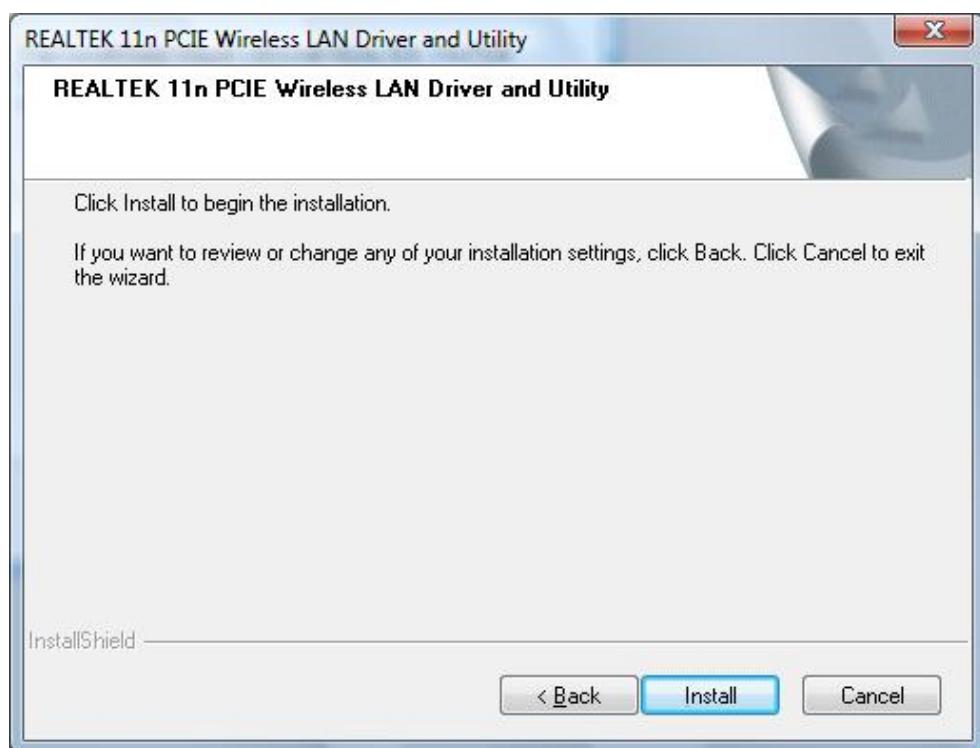


3. The welcome window pops up. Click the "Next" button to proceed.

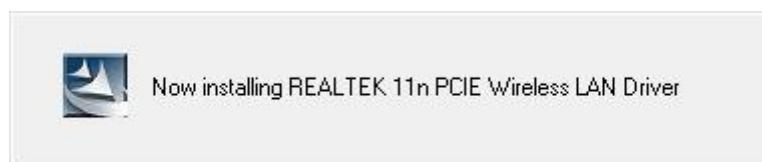


# Wireless 11n 1T2R PCI-E Card

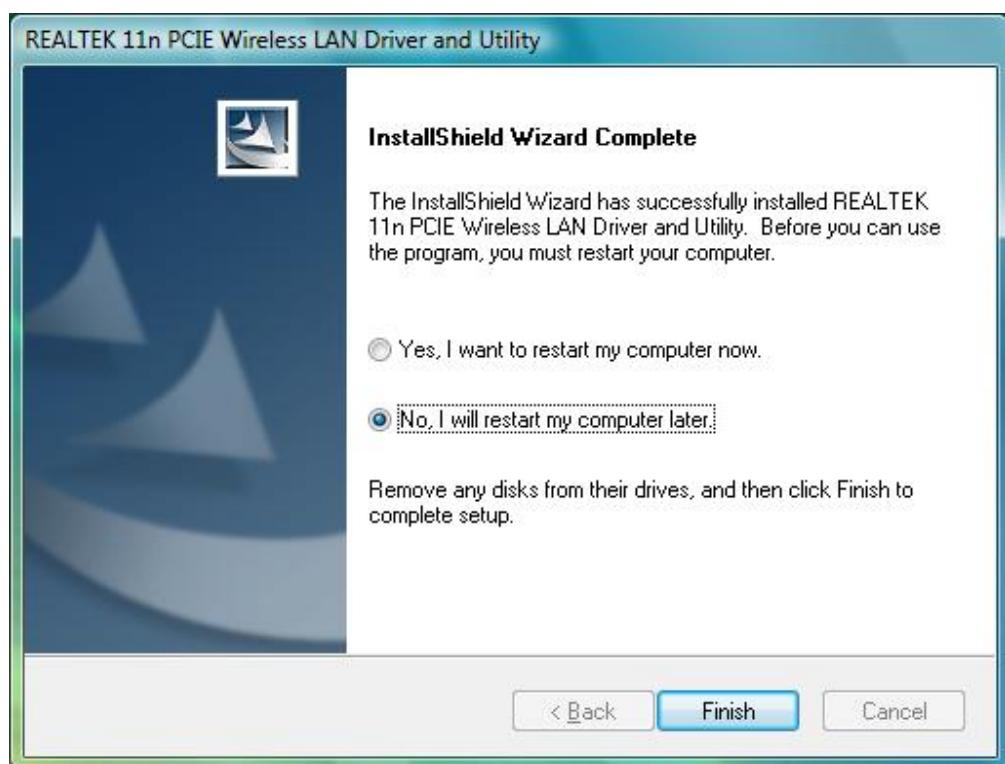
4. Click the “Install” button to start installing.



5. Please wait again while installation



6. After all the steps above, you will see the screen below, Select “Yes” or “No”, then click Finish.

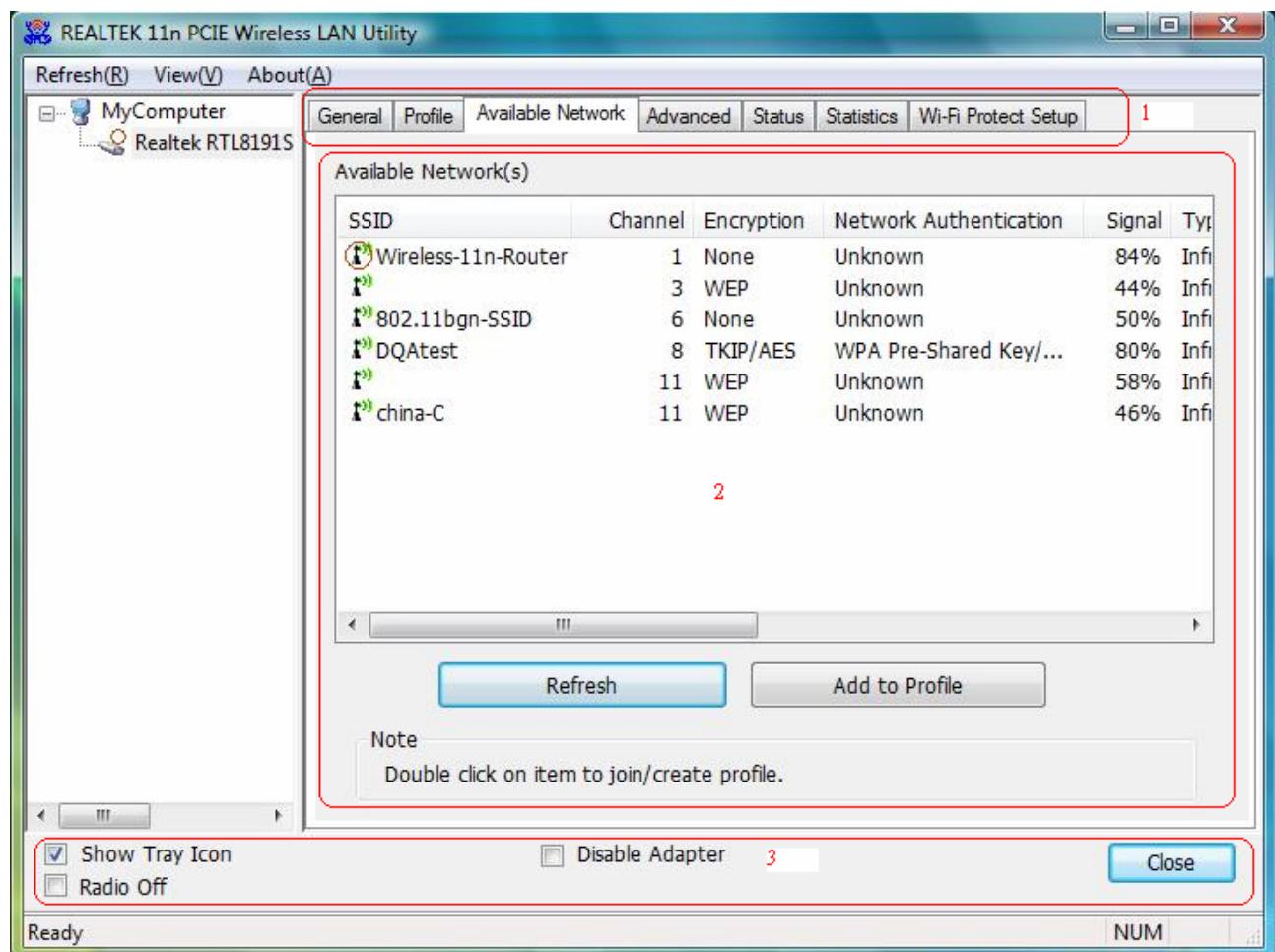


## 4.2 Management Guide

This chapter describes how to configure your Adapter for wireless connectivity on your Wireless Local Area Network (WLAN) and use the data security encryption features.

After Installing the Adapter, the Adapter's tray icon will appear in your system tray. It appears at the bottom of the screen, and shows the signal strength using color and the received signal strength indication (RSSI).

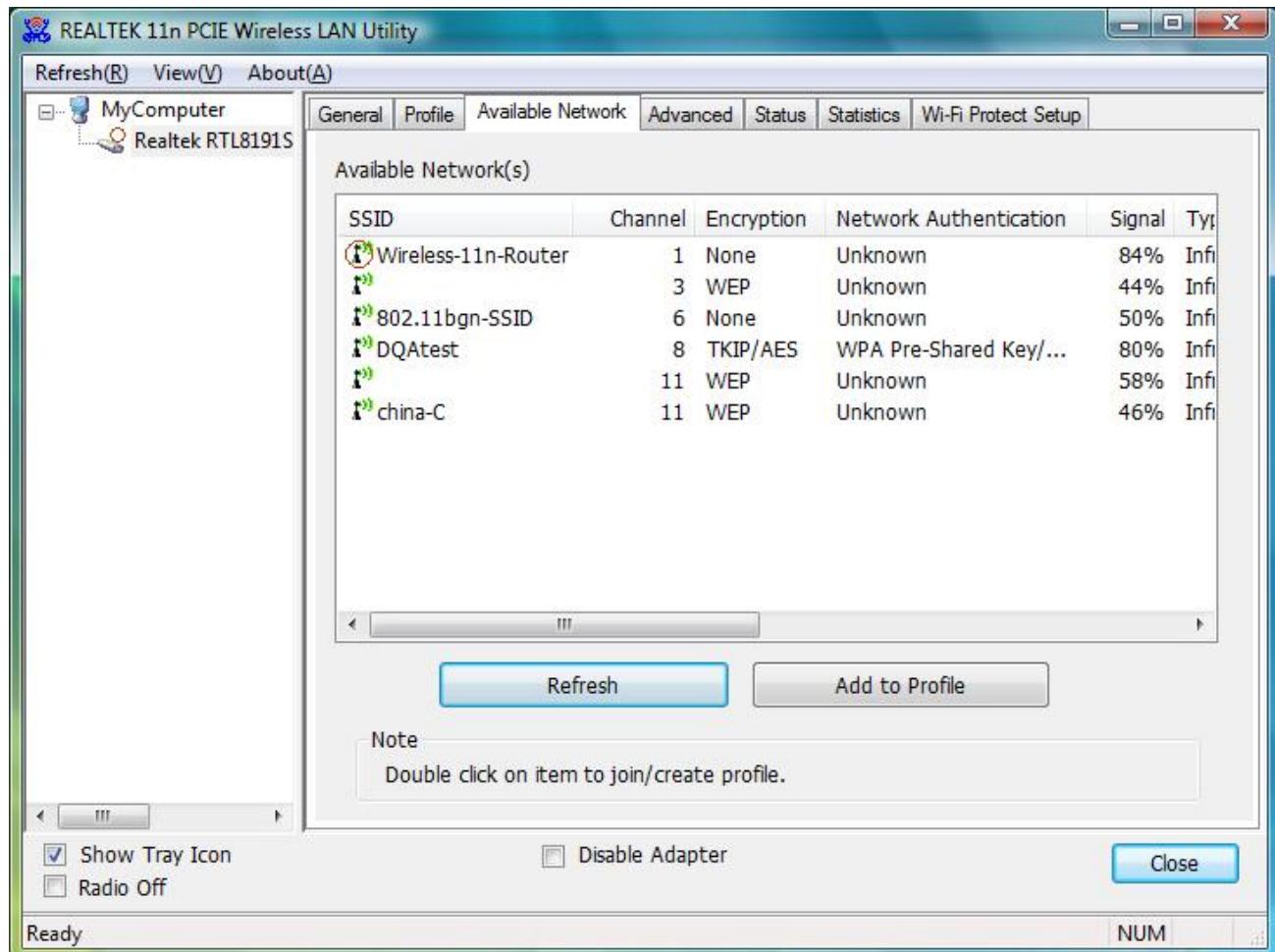
### 4.2.1 Interfaces



- Functional Buttons** : on top of the window. You can click each button to access each configuration window.
- Configuration Column** : Center of the Utility window. Make your changes for each function in this part.
- Optional Table** : "Show Tray Icon", "Disable Adapter", "Radio off", "Windows Zero Config"

## 4.2.2 Available Network

This network lists the available wireless networks. The Utility connects to a wireless network with best signal strength automatically. You can refresh the connecting network by clicking on the network name and click the **Refresh** button. In the center of the Utility windows, you will see detail information of each network.



### Available Network Information:

Items	Information
<b>SSID</b>	The name of the IEEE 802.11 wireless network. This field has a maximum limit of 32 characters.
<b>Channel</b>	Display current channel in use.
<b>Encryption</b>	Shows the encryption mode in use. There are total 4 modes: None, WEP, TKIP and AES.
<b>Network Authentication</b>	Shows the authentication mode in use.
<b>Signal</b>	This percentage shows the strength of the signal.

Type	The type of network and the station currently connected are shown here. The options include : <b>Infrastructure &amp; Ad-Hoc</b>
BSSID	The IEEE MAC address of locally-managed, generating from a 46 random code.
Support Rates	Show current rate

### 4.2.3 Profile

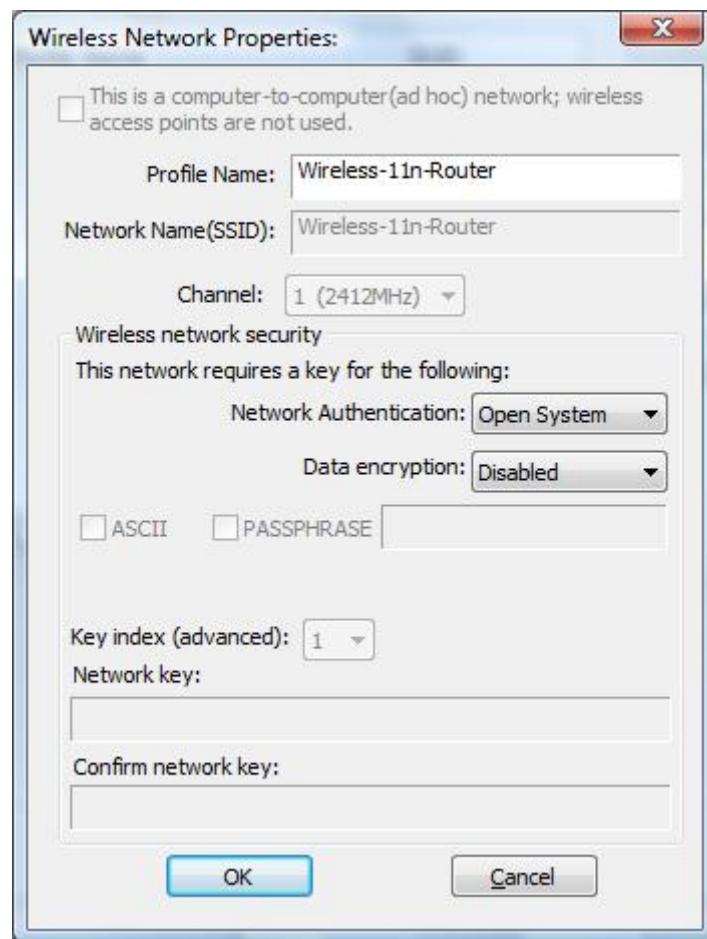
1. Add a new profile:

(1) Selecting an available network in the “Available Network” function then click the **Add to Profile** button, or double click the network name. You could also add a new profile quickly by clicking the **Add** button in the “Profile” function.

**Note:** If the network you add to profile is not encrypted, “Unsecured network” window will pop up, then Click “OK”.



(2) It displays “Wireless Network Properties” dialog box. This profile page allows users to save different wireless settings, which helps users to get access to wireless networks at home, office or other wireless network environments quickly.



(3). Channel (Country Region Code): seven countries to choose. Country channel list:

Country	Channel Range	Country	Channel Range
USA	CH1 ~ CH11	FRANCE	CH10 ~ CH13
CANADA	CH1 ~ CH11	JAPAN	CH1 ~ CH14
ETSI	CH1 ~ CH13	ISRAEL	CH1 ~ CH13
SPAIN	CH10 ~ CH11		

(4) Wireless Network Security

#### A. Network Authentication

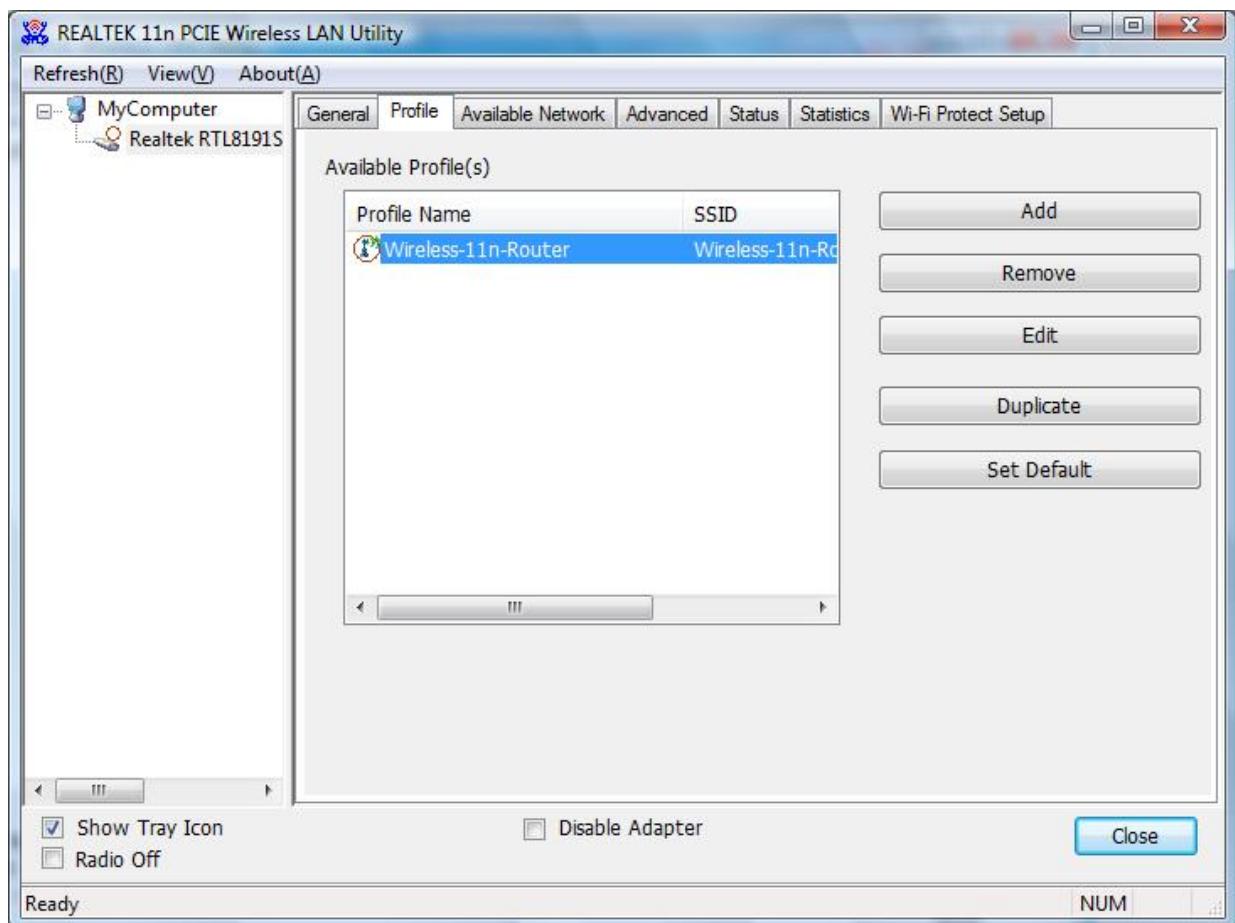
Select the Security tab in the screen above. To define the security mode, select the desired security mode as follows. There are 7 types supported: Open System, Shared Key, WPA-PSK, WPA2-PSK, and WPA 802.1X, WPA2 802.1X, WEP 802.1X, Please select a type from the drop down list

## B. Data Encryption:

<b>Data encryption</b>	<p>There are 4 types supported: Disabled, WEP, TKIP and AES. The available encryption selection will differ from the authentication type you have chosen, the result is shown below:</p>	
	<b>Authentication</b>	<b>Available Encryption Selection</b>
	Open System	Disabled, WEP
	Shared Key	WEP
	WPA-PSK, WPA2-PSK, and WPA 802.1X, WPA2 802.1X	TKIP, AES
	WEP 802.1X	WEP

**Note:** Select different Security Options, the configurations are different; you can select the appropriate security option and configure the exact key as your need.

(5) Finish the configuration, and then click “OK”, that network has been added to the profile.



**Profile List:** The list shows all the profiles you have added before.

**Buttons:** You can click on these buttons to **Add** a new profile, **Remove**, **Edit**, **Duplicate** or **Set Default** an old profile.

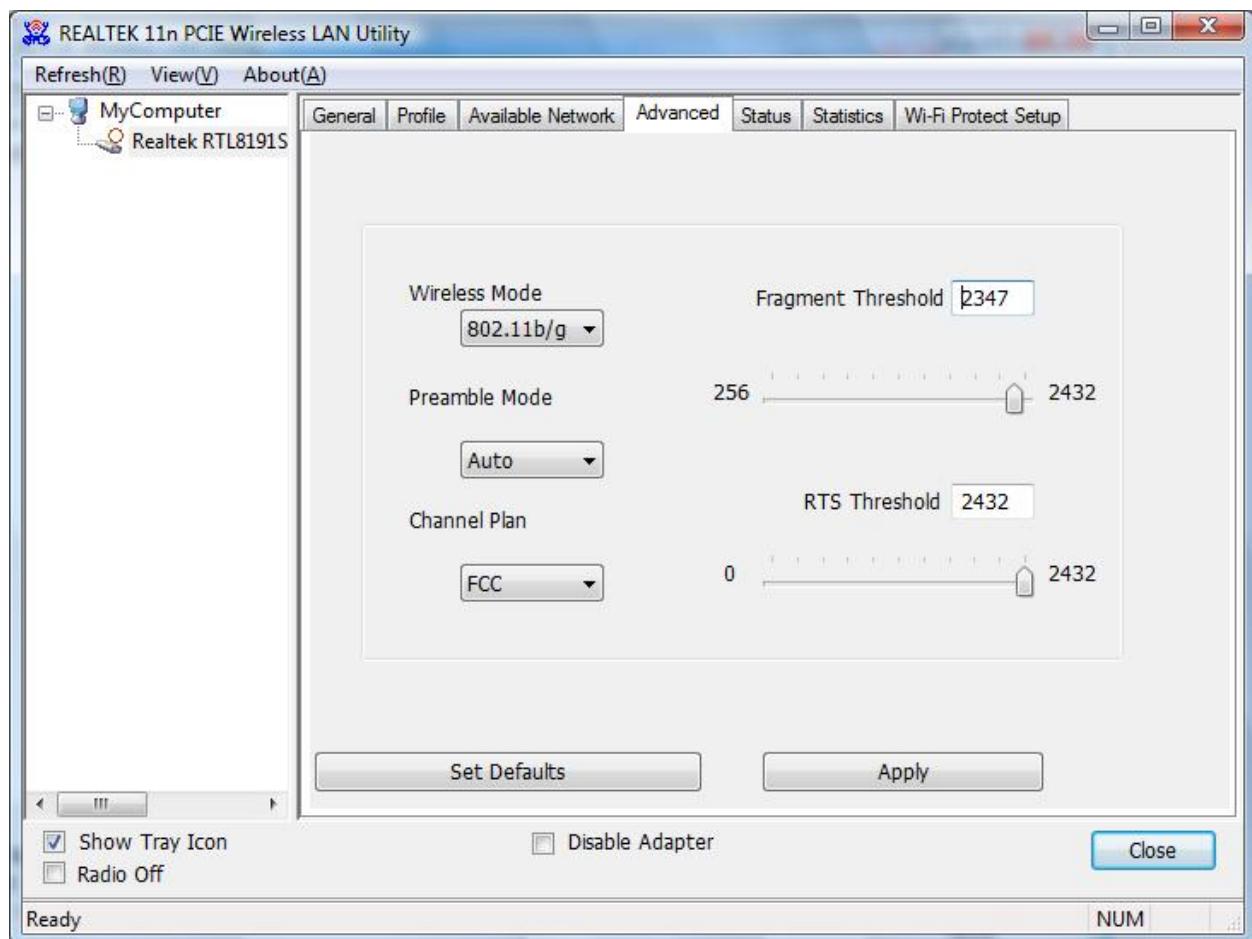
## 4.2.4 General

Click the “General” button, you will see there are some items as following:

Items	Information
<b>Status</b>	Currently connection status
<b>Speed</b>	Show current transmit rate and receive rate
<b>Type</b>	Network type in use.
<b>Encryption</b>	Encryption type in use.
<b>SSID</b>	The name of the IEEE 802.11 wireless network. This field has a maximum limit of 32 characters.
<b>Signal Strength</b>	Receive signal strength
<b>Link Quality</b>	Display connection quality based on signal strength
<b>Network Address</b>	A. MAC Address : The MAC address of the wireless network adapter. B. IP Address : IP address of current connection. C. Subnet Mask : Subnet mask of current connection. D. Gateway : Gateway of current connection.

## 4.2.5 Advanced

This screen below allows you to make advanced configuration for the profile. Please refer to the following chart for definitions of each item.



#### 4.2.6 Status

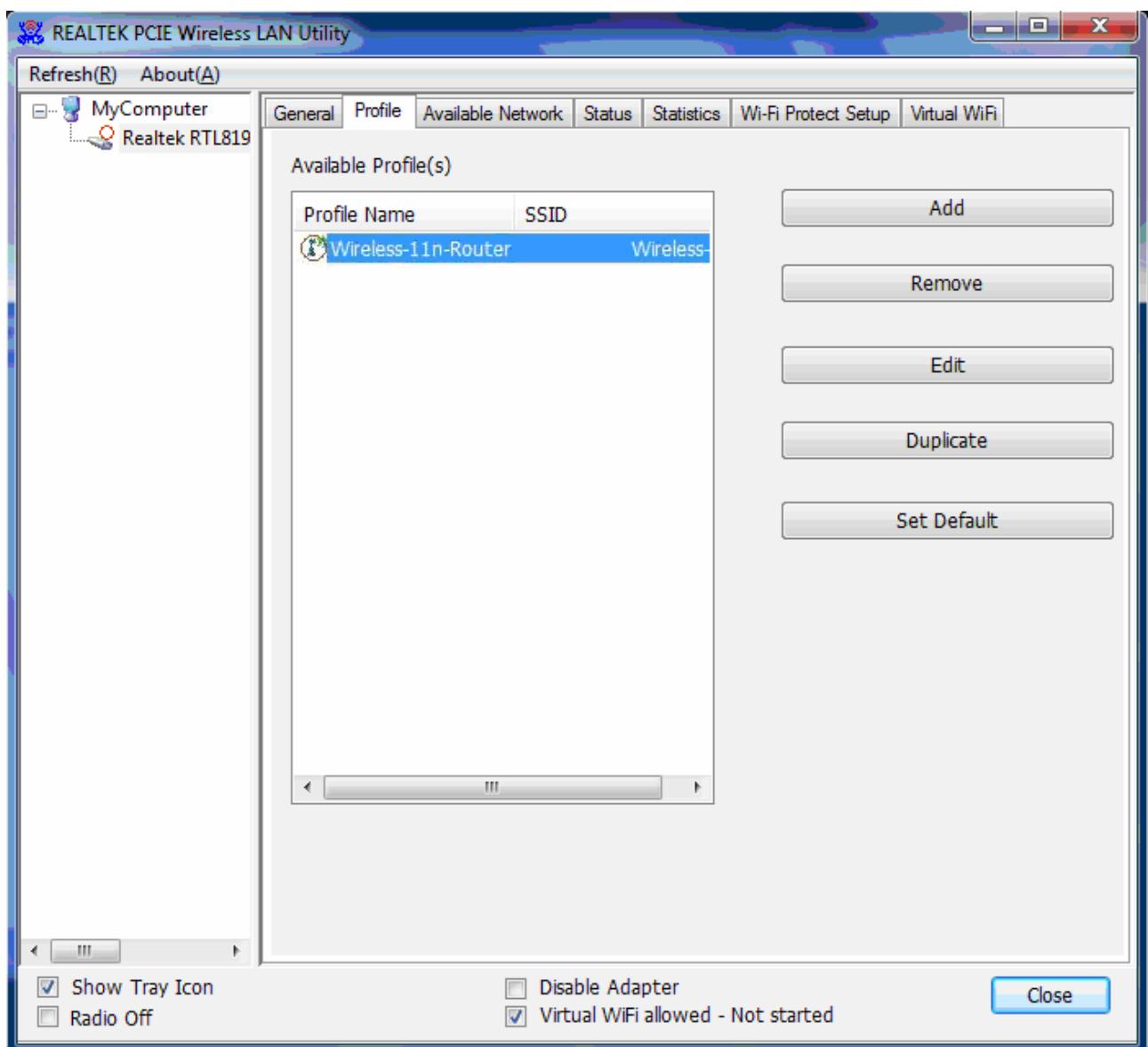
The Status tab contains general information about the program and its operations. The current Status tab needn't any configurations.

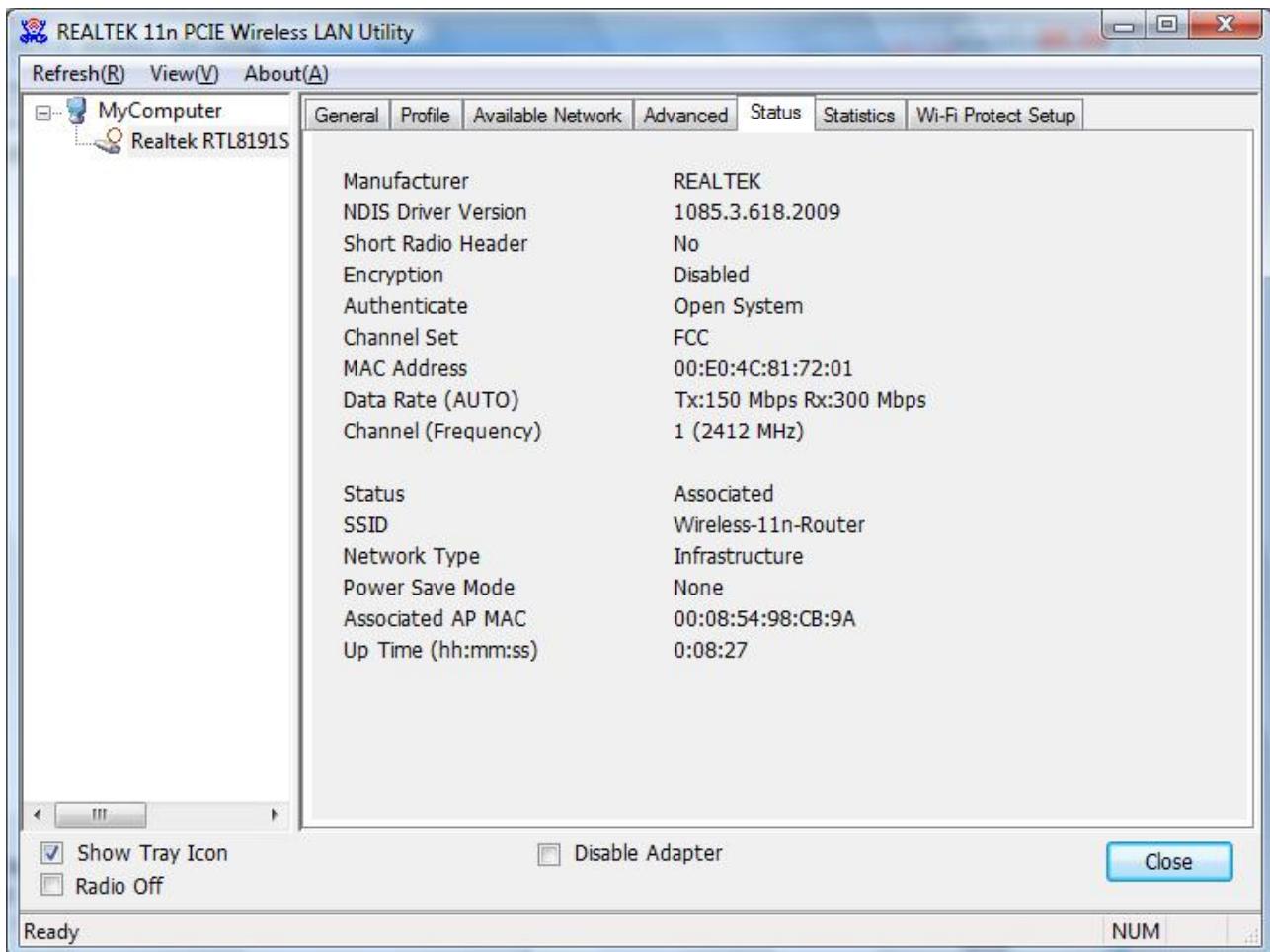
The following table describes the items found on the Status screen.

Items	Information
<b>Manufacturer</b>	The name of manufacturing this product
<b>NDIS Driver Version</b>	The version of Network Driver Interface Specification
<b>Encryption</b>	Here displays the encryption type the device is using
<b>Authenticate</b>	This shows whether the server based authentication is used.
<b>Channel Set</b>	Appears the Channel you use
<b>MAC Address</b>	The MAC address of the wireless network adapter.
<b>Data Rate(Auto)</b>	Show current transmit rate and receive rate
<b>Channel Frequency</b>	Shows the channel in use (1~14)

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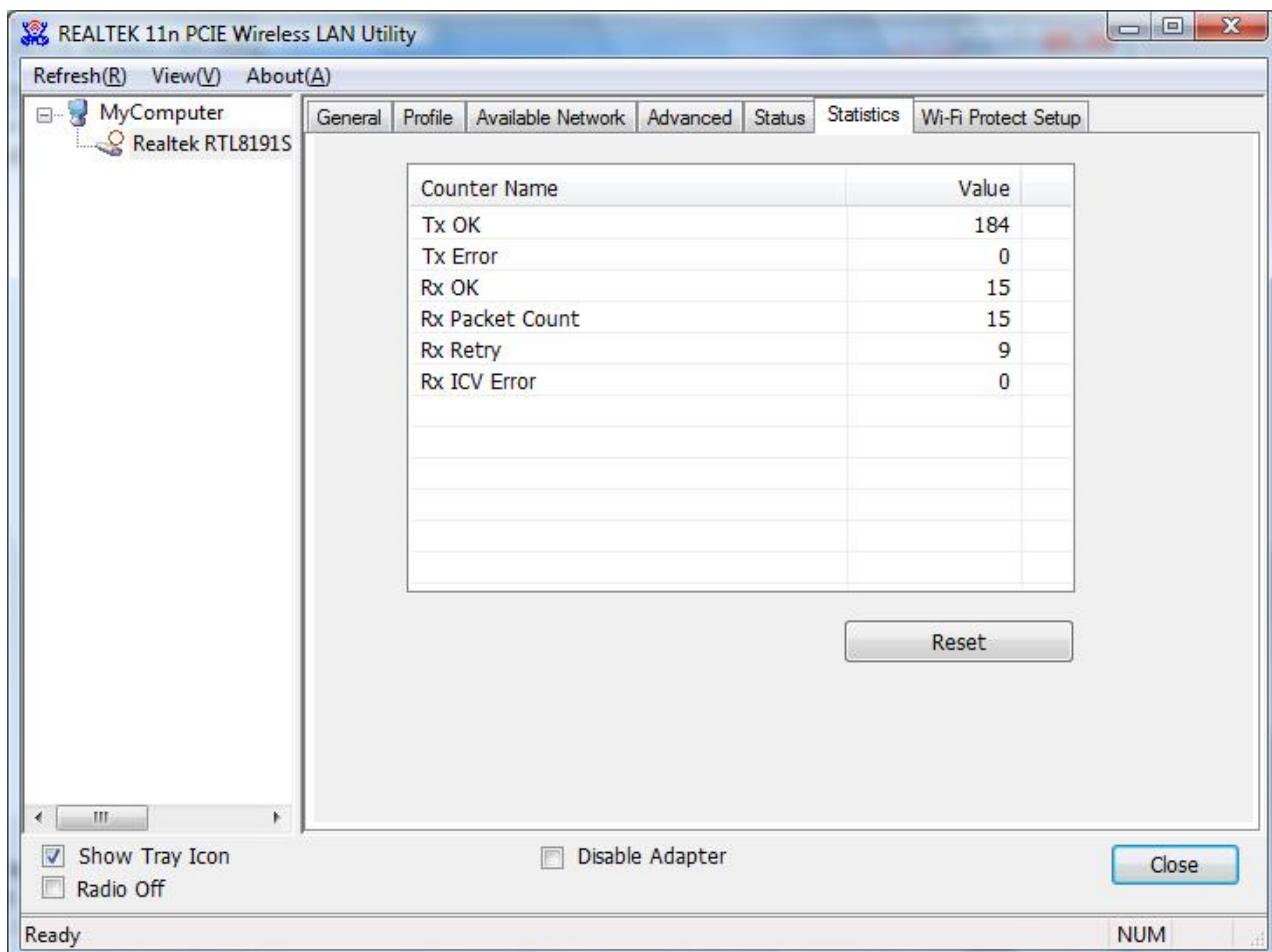
<b>Status</b>	Current connection status
<b>SSID</b>	The SSID of the wireless system.
<b>Network Type</b>	The type of network and the station currently connected are shown here. The options include : Infrastructure, Ad Hoc
<b>Power Save Mode</b>	The power save mode have three mode: Max, Min, None
<b>Associated AP MAC</b>	The MAC Address of associated AP
<b>Up Time</b>	Record life time





## 4.2.7 Statistics

Statistics page displays the detail counter information based on 802.11 MIB counters. This page translates the MIB counters into a format easier for user to understand. It show receiving and transmitting statistical information about the following receiving and transmitting diagnostics for frames received by or transmitted to the wireless network adapter.



Items	Information
<b>TX OK</b>	Successfully transmitted frames numbers.
<b>TX Error</b>	Frames numbers transmitting with error.
<b>RX OK</b>	Successfully received frames numbers.
<b>Rx Packet Count</b>	The packets of receiving frames
<b>RX Retry</b>	Frames numbers re-receiving
<b>RX ICV Error</b>	Integrity Check Value receiving with error.
<b>Reset Counter</b>	Reset counters to zero.

#### 4.2.8 Wi-Fi Protect Setup

The primary goal of Wi-Fi Protected Setup (Wi-Fi Simple Configuration) is to simplify the security setup and management of Wi-Fi networks. This adapter supports the configuration setup using PIN configuration method or PBC configuration method. If the wireless card supports Wi-Fi Protected Setup (WPS), you can establish a wireless connection between wireless card and router using either Push Button Configuration (PBC) method or PIN method.

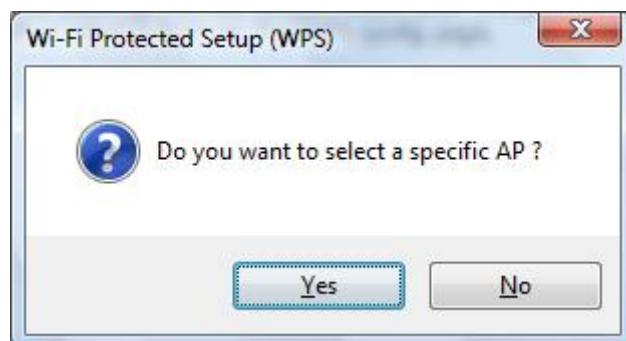
Here we will introduce two ways to configure the QSS

(QSS is known as rapid security settings, by pressing the wireless router and wireless card on the QSS button to automatically set up WPA2 secure connection level without the router or network adapter management software to conduct the cumbersome interface settings, greatly simplifying the operation of the wireless security settings.)

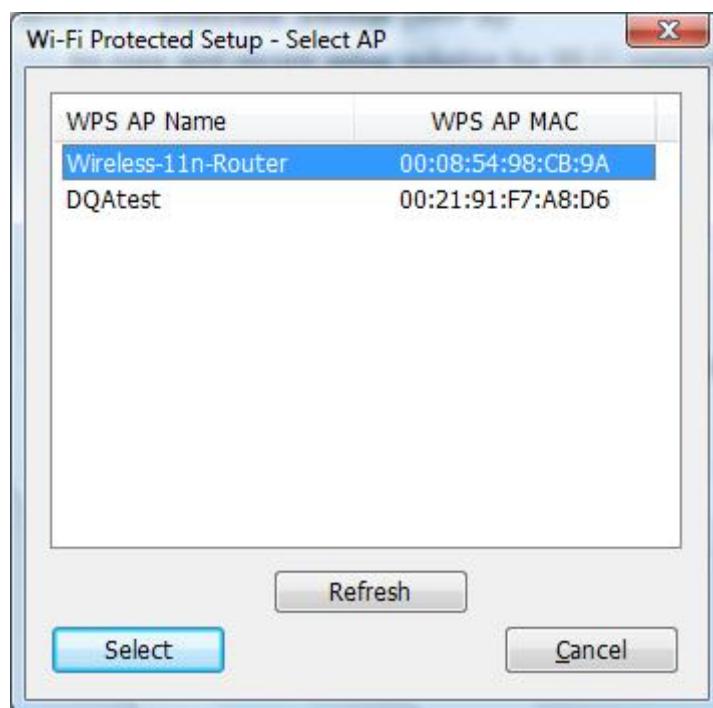
**Pin Code:** 8-digit numbers. It is randomly generated from system

## 1. PIN method

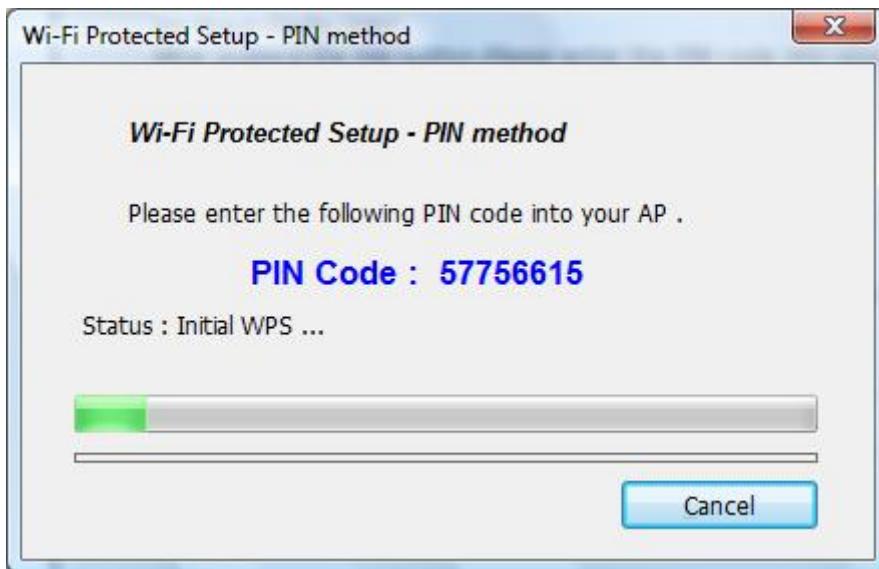
Click the button “Pin Input Config (PIN)”, and then come to the following figure.



Click the button “Yes”, you can select one of the AP.



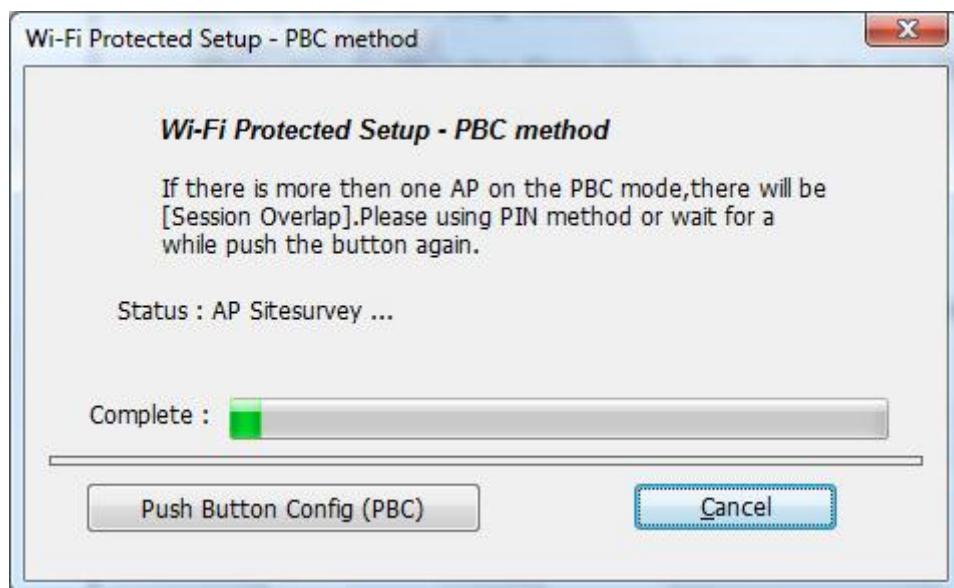
In this figure, you can operate these buttons “Refresh / Select / Cancel”. Select the name of one AP, then click “Select” button, you could use PIN method to configure the QSS.



Double click the Internet WEB browser icon on your desktop screen. Type the IP address of you selected router/AP into the URL and press Enter, and then you can enter the configuration. Please enter the WPS ( Wi-Fi ) configuration page, type the PIN code of adapter and click confirm button to build WPS connection. WPS connection will be successful by PIN method after several minutes.

## 2. PBC (Push Button Configuration) method

After pushing the PBC button, Please push the physical button on your AP or visual button on the WPS config page, then come to the following figure.



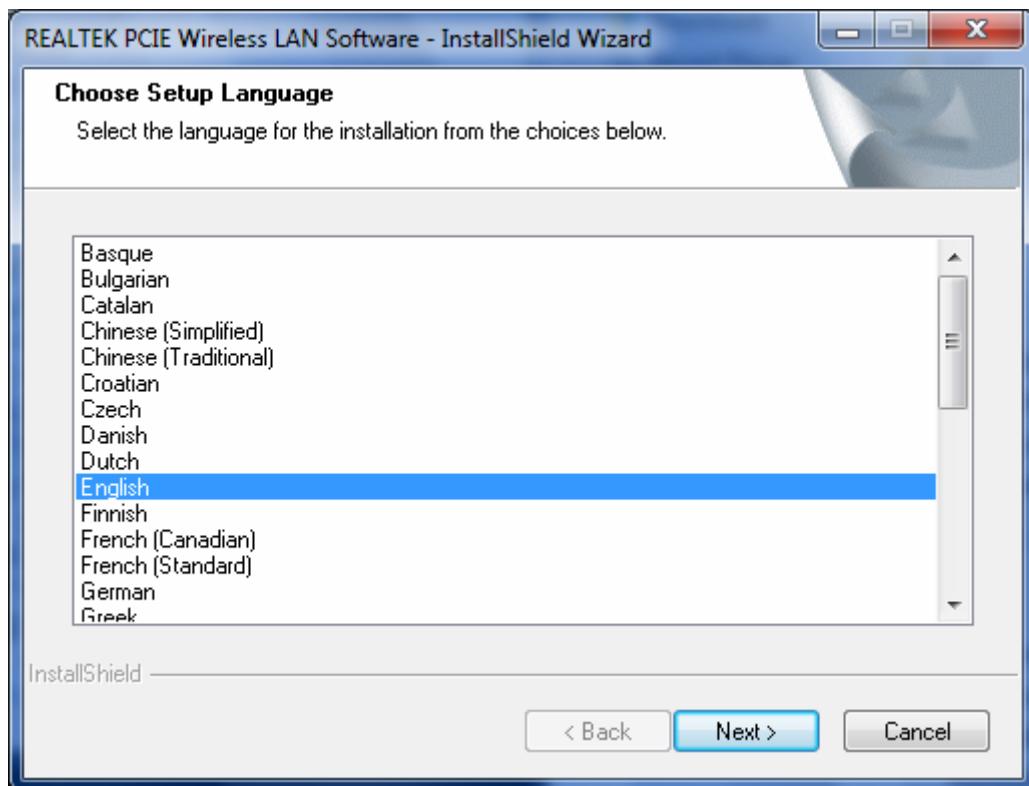
Please enter the WPS ( Wi-Fi ) configuration page of your desired router/AP, and then start PCB connection. WPS connection will be successful by PBC method after several minutes.

## Chapter 5 Introduction for Windows 7 User

### 4.1 Software Installation

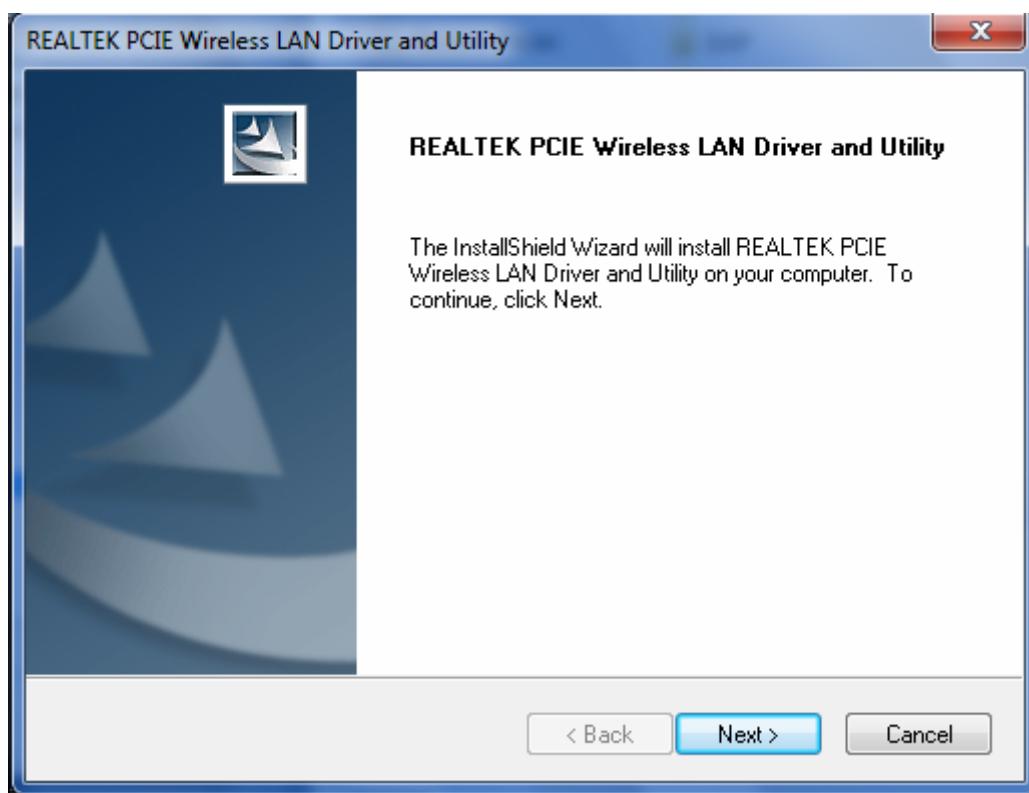
1, Insert the CD into your CD-Rom, and then appear an interface. Please click on **PCI-E> Driver> Win 7** to start the installation.

2, When the language-selecting window pops up. Please select the language you use and click "Next".

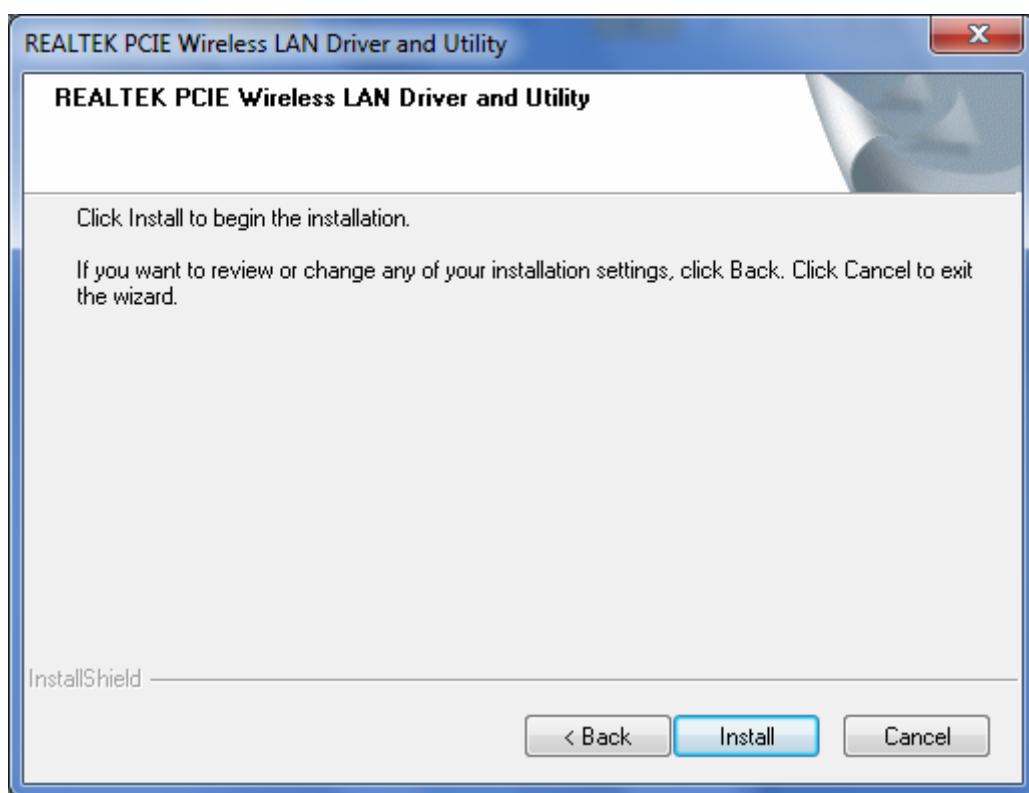


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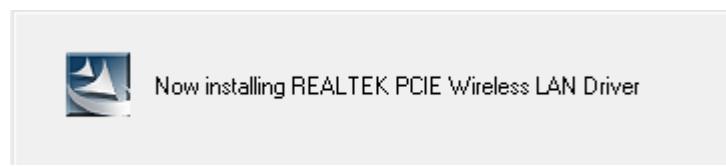
3, The welcome window pops up. Click the “Next” button to proceed.



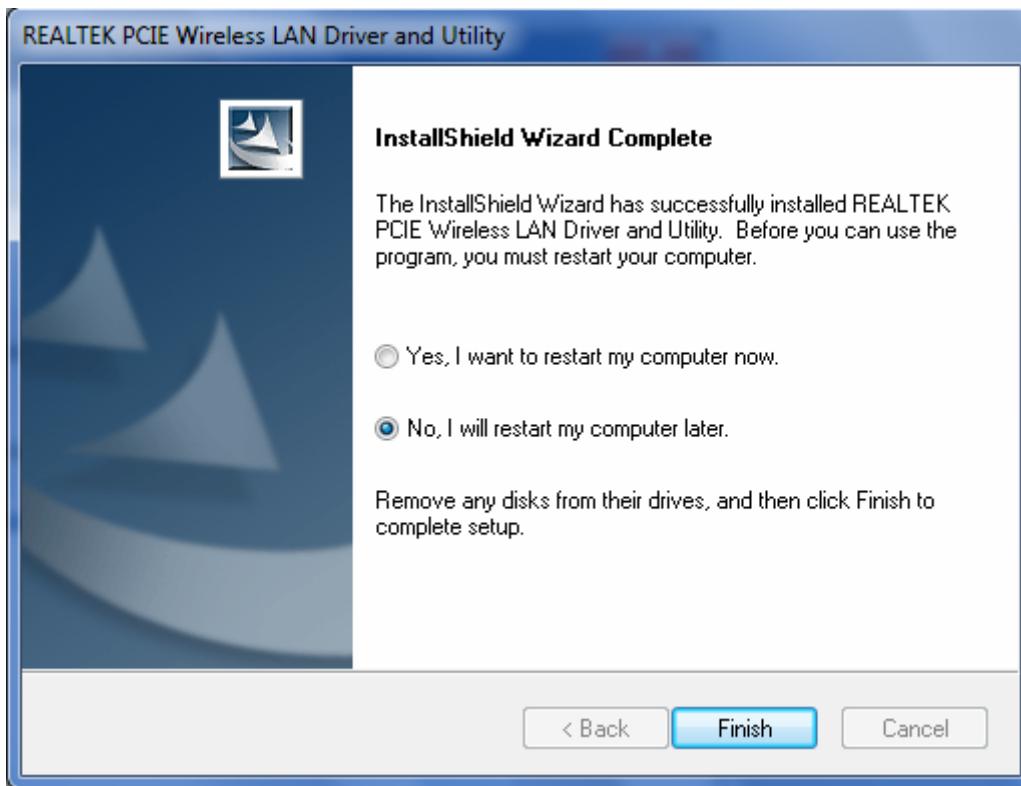
4, Click the “Install” button to start installing.



5, Please wait again while installation



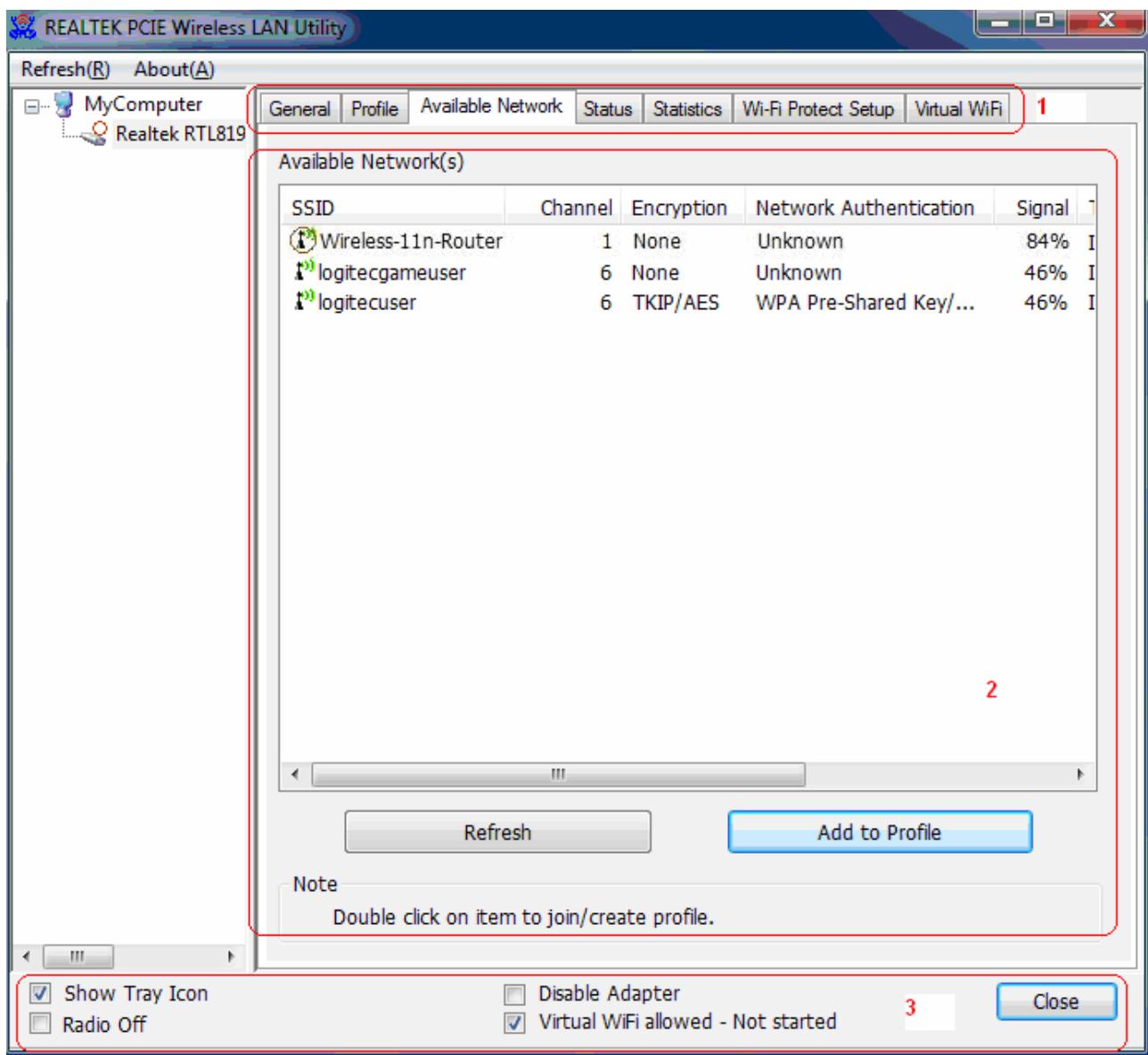
6, After all the steps above, you will see the screen below, Select “Yes” to reboot the computer immediately or “No” to restart the computer later, then click Finish.



## 4.2 Management Guide

This chapter describes how to configure your Adapter for wireless connectivity on your Wireless Local Area Network (WLAN) and use the data security encryption features.

After Installing the Adapter, the Adapter's tray icon will appear in your system tray. It appears at the bottom of the screen, and shows the signal strength using color and the received signal strength indication (RSSI). Click this tray icon and the following interface will pop up:

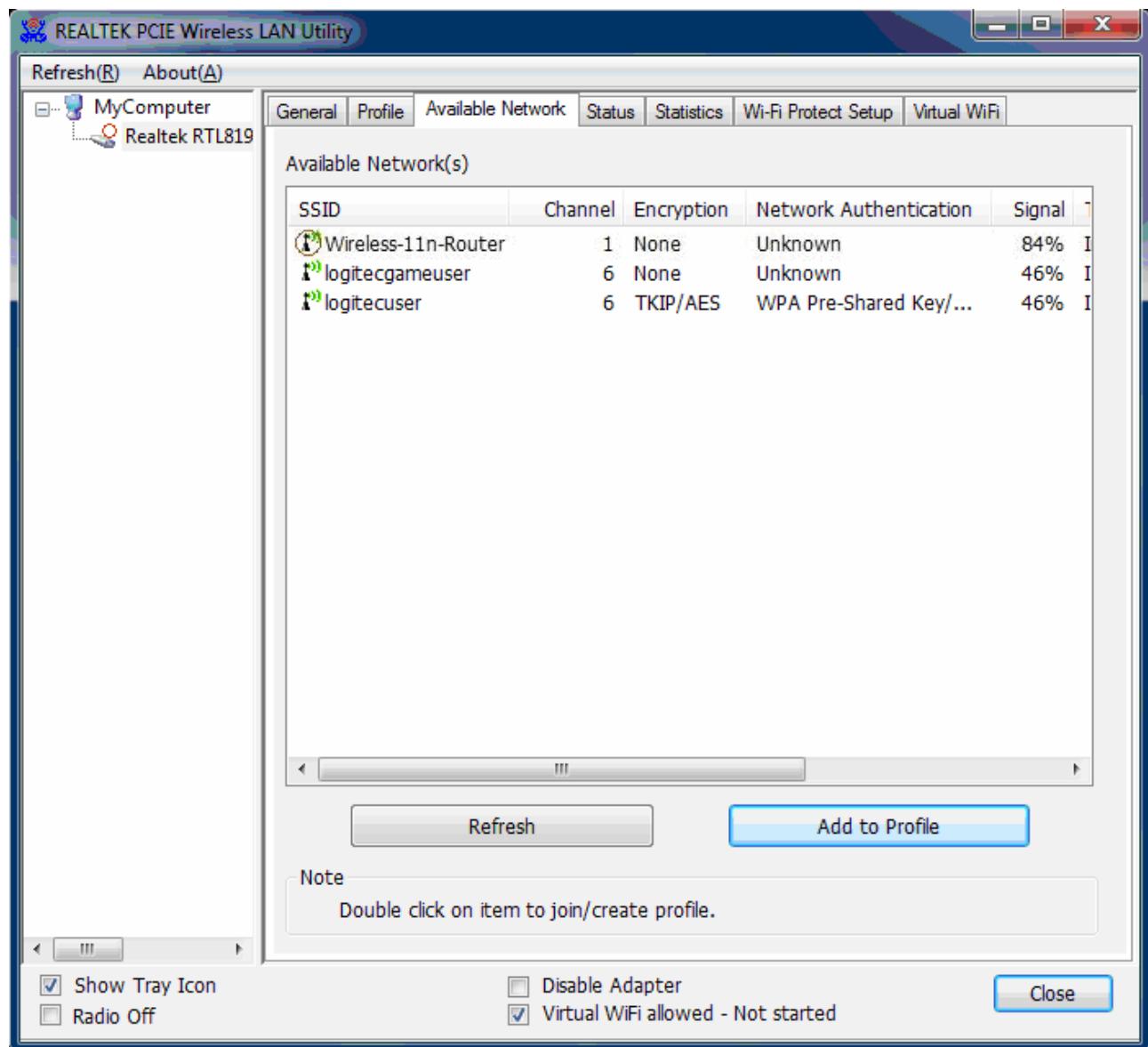


- Functional Buttons** : on top of the window. You can click each button to access each configuration window.
- Configuration Column** : Center of the Utility window. Make your changes for each function in this part.
- Optional Table** : Under the bottom you can select or not the check boxes to function or not "Show Tray Icon", "Disable Adapter", "Radio off", "Virtual WiFi allowed"

## 4.2.1 Available Network

This network lists the available wireless networks. The Utility connects to a wireless network with best signal strength automatically. You can refresh the connecting network by clicking on the network name and click the **Refresh** button. In the center of the Utility windows, you will see detail

information of each network.



## Available Network Information:

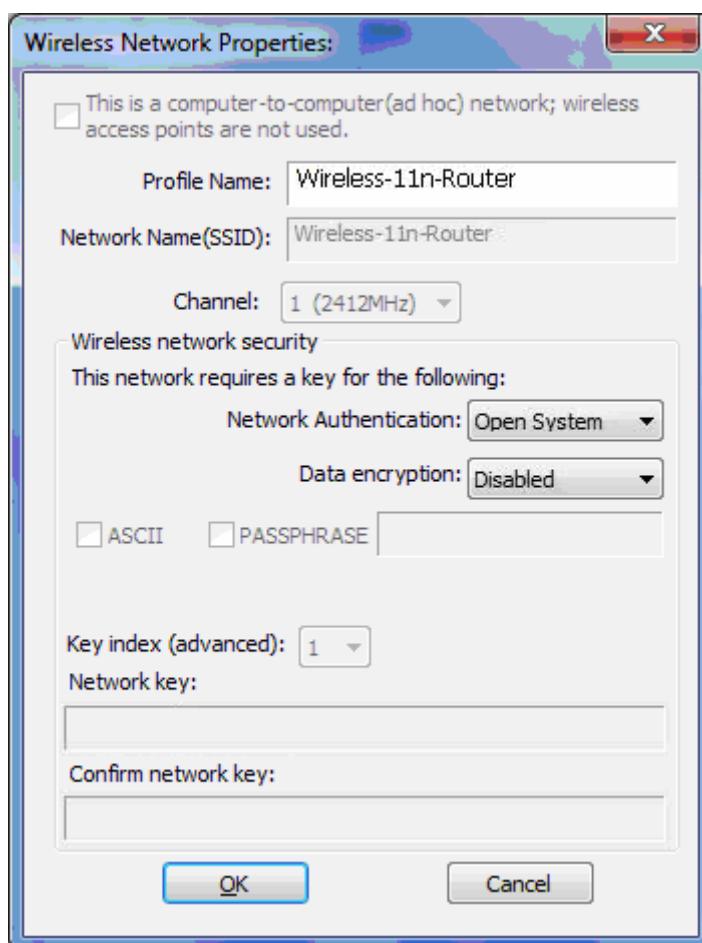
Items	Information
<b>SSID</b>	The name of the IEEE 802.11 wireless network. This field has a maximum limit of 32 characters.
<b>Channel</b>	Display current channel in use.
<b>Encryption</b>	Shows the encryption mode in use. There are total 4 modes: None, WEP, TKIP and AES.
<b>Network Authentication</b>	Shows the authentication mode in use.
<b>Signal</b>	This percentage shows the strength of the signal.

Type	The type of network and the station currently connected are shown here. The options include : <b>Infrastructure &amp; Ad-Hoc</b>
BSSID	The IEEE MAC address of locally-managed, generating from a 46 random code.
Support Rates	Show current rate

### 4.2.3 Profile

1. Add a new profile:

(1) Selecting an available network in the “Available Network” function then click the **Add to Profile** button, or double click the network name. You could also add a new profile quickly by clicking the **Add** button in the “Profile” function. When you select **Add to Profile** button, it displays “Wireless Network Properties” dialog box. This profile page allows users to save different wireless settings, which helps users to get access to wireless networks at home, office or other wireless network environments quickly.



(3). Channel (Country Region Code): seven countries to choose. Country channel list:

Country	Channel Range	Country	Channel Range
---------	---------------	---------	---------------

USA	CH1 ~ CH11	FRANCE	CH10 ~ CH13
CANADA	CH1 ~ CH11	JAPAN	CH1 ~ CH14
ETSI	CH1 ~ CH13	ISRAEL	CH1 ~ CH13
SPAIN	CH10 ~ CH11		

## (4) Wireless Network Security

### A. Network Authentication

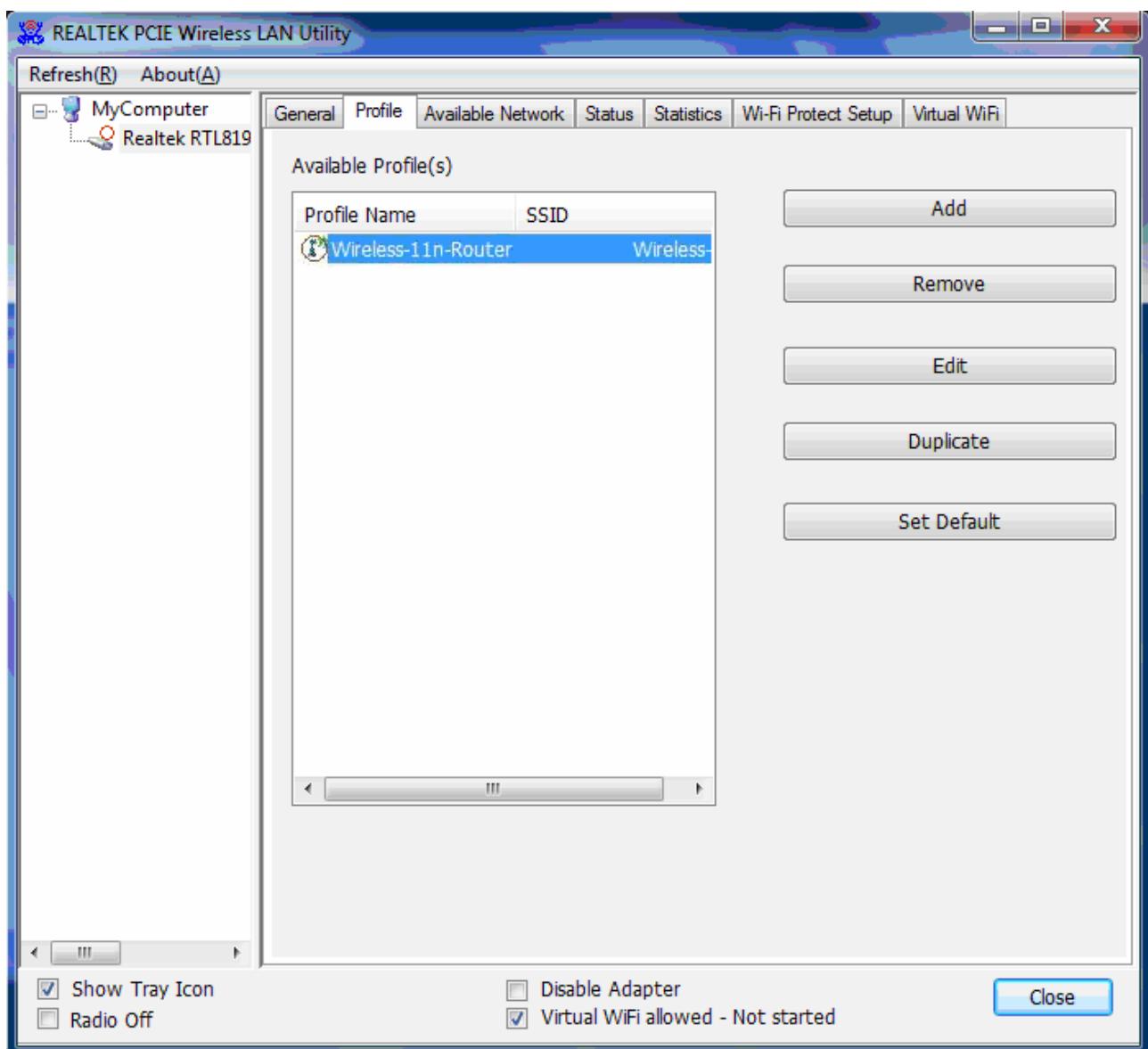
Select the Security tab in the screen above. To define the security mode, select the desired security mode as follows. There are 7 types supported: Open System, Shared Key, WPA-PSK, WPA2-PSK, and WPA 802.1X, WPA2 802.1X, WEP 802.1X, Please select a type from the drop down list

### B. Data Encryption:

<b>Data encryption</b>	There are 4 types supported: Disabled, WEP, TKIP and AES. The available encryption selection will differ from the authentication type you have chosen, the result is shown below:	
	<b>Authentication</b>	<b>Available Encryption Selection</b>
	Open System	Disabled, WEP
	Shared Key	WEP
	WPA-PSK, WPA2-PSK, and WPA 802.1X, WPA2 802.1X	TKIP, AES
	WEP 802.1X	WEP

**Note:** Select different Security Options, the configurations are different; you can select the appropriate security option and configure the exact key as your need.

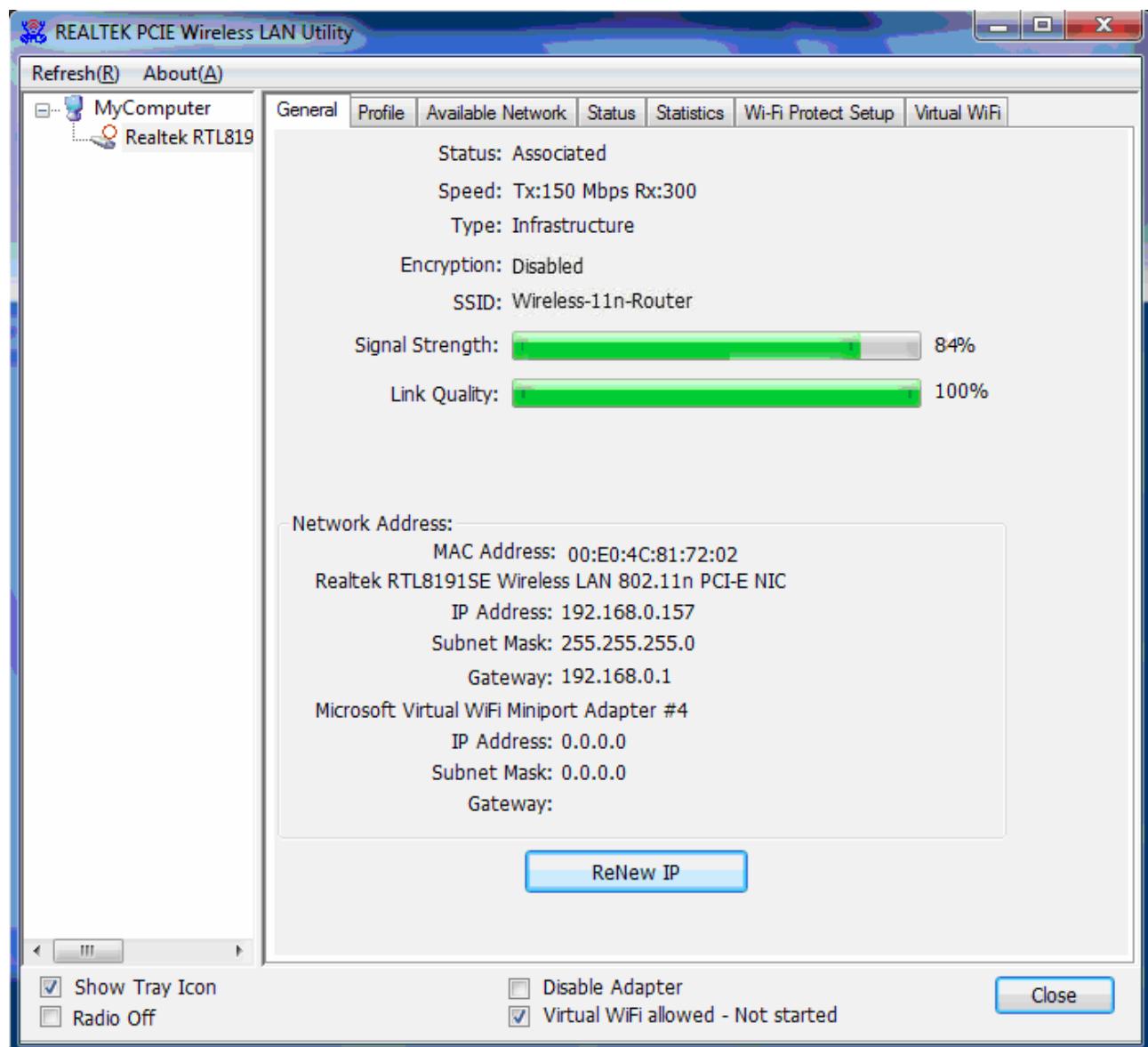
(5) If you've set passwords to security your network, you have to write down the Network key and Confirm network key column then you can finish the configuration by click "OK", and the network has been added to the profile. Please reference to below interface:



**Profile List:** The list shows all the profiles you have added before.

**Buttons:** You can click on these buttons to **Add** a new profile, **Remove**, **Edit**, **Duplicate** or **Set Default** an old profile.

## 4.2.4 General



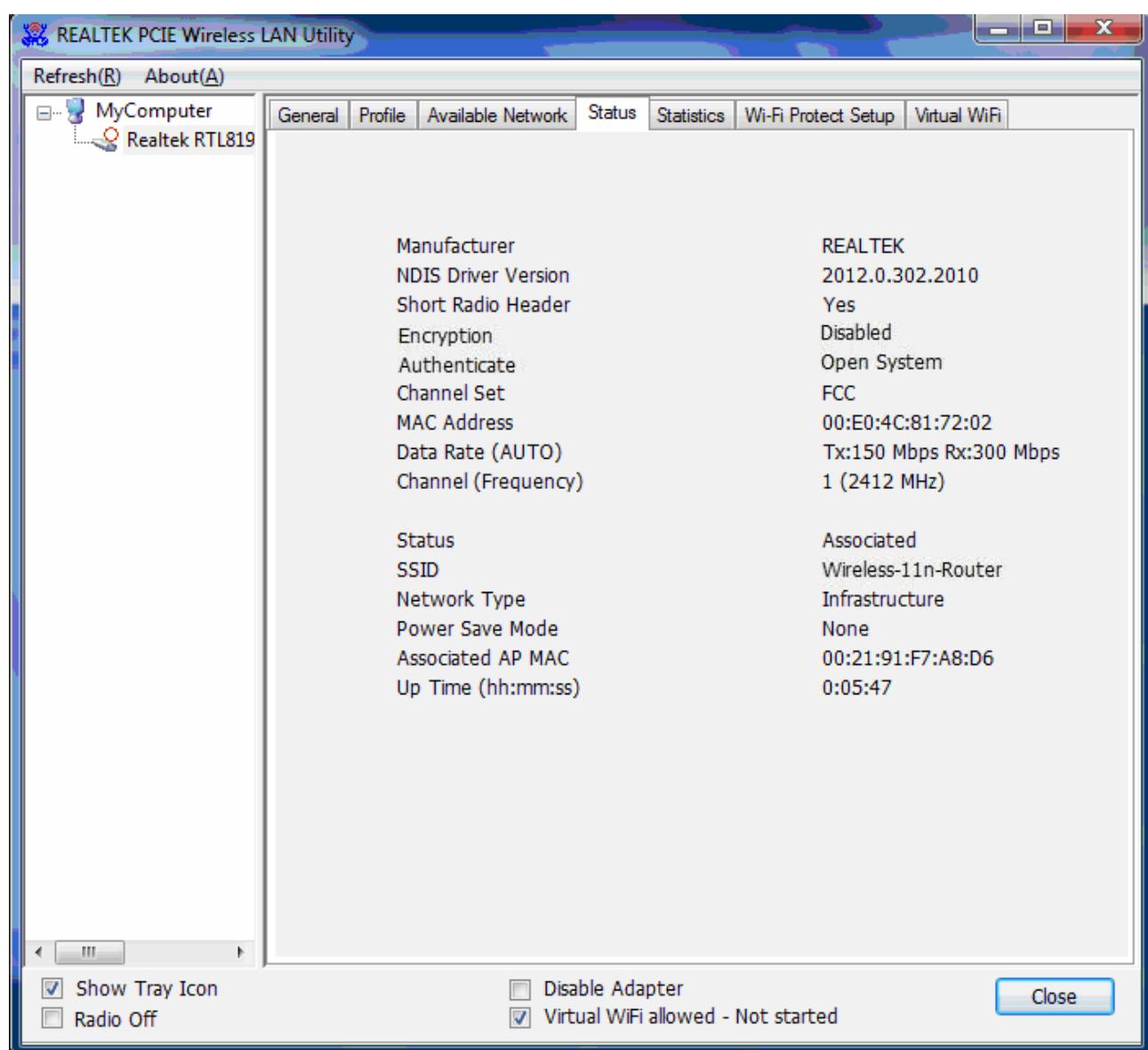
Information for above items:

Items	Information
<b>Status</b>	Currently connection status
<b>Speed</b>	Show current transmit rate and receive rate
<b>Type</b>	Network type in use.
<b>Encryption</b>	Encryption type in use.
<b>SSID</b>	The name of the IEEE 802.11 wireless network. This field has a maximum limit of 32 characters.
<b>Signal Strength</b>	Receive signal strength

<b>Link Quality</b>	Display connection quality based on signal strength
<b>Network Address</b>	A. MAC Address : The MAC address of the wireless network adapter. B. IP Address : IP address of current connection. C. Subnet Mask : Subnet mask of current connection. D. Gateway : Gateway of current connection.

## 4.2.6 Status

The Status tab contains general information about the program and its operating condition.



The following table describes the items found on the Status screen.

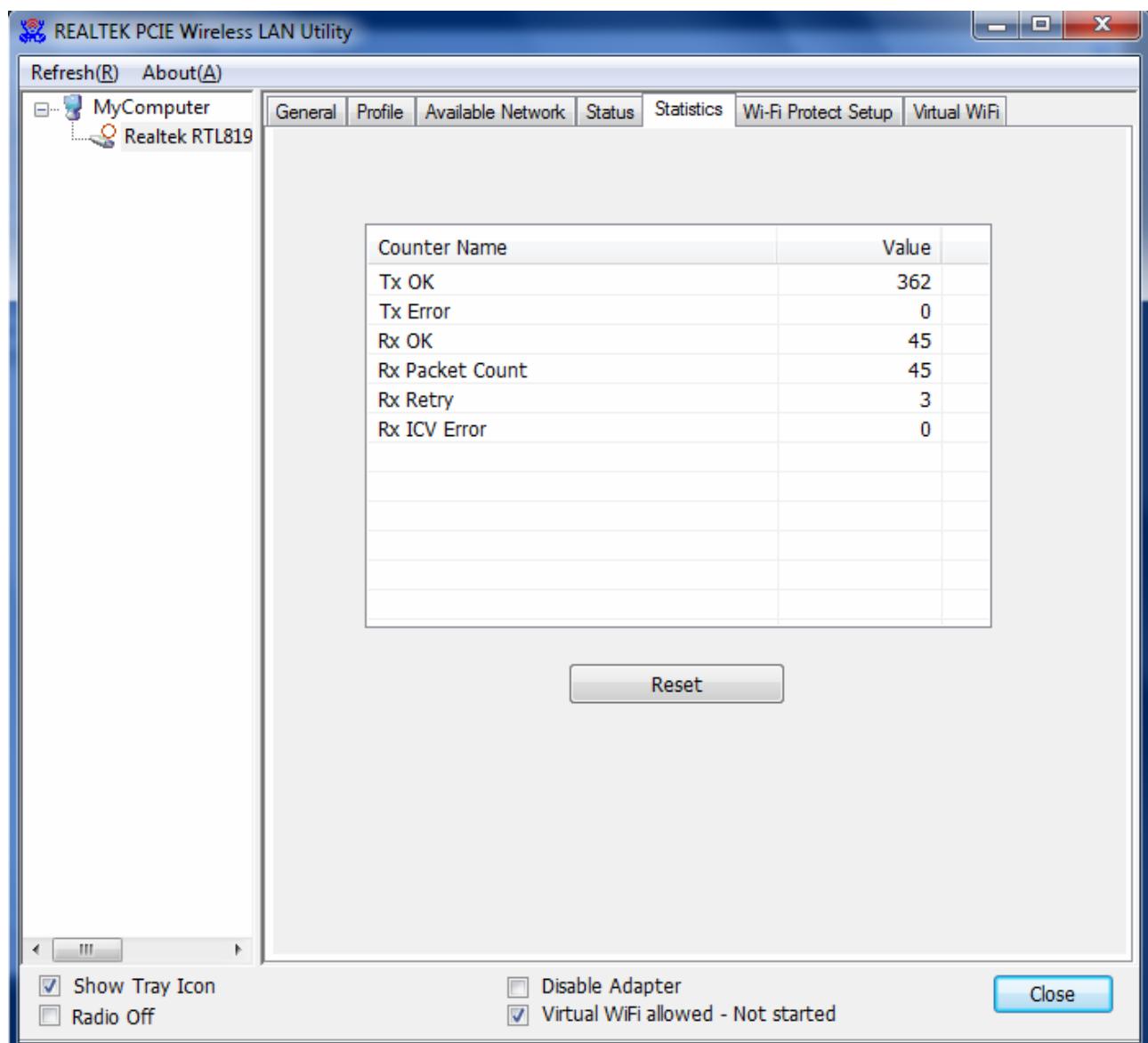
Items	Information

<b>Manufacturer</b>	The name of manufacturing this product
<b>NDIS Driver Version</b>	The version of Network Driver Interface Specification
<b>Encryption</b>	Here displays the encryption type the device is using
<b>Authenticate</b>	This shows whether the server based authentication is used.
<b>Channel Set</b>	Appears the Channel you use
<b>MAC Address</b>	The MAC address of the wireless network adapter.
<b>Data Rate(Auto)</b>	Show current transmit rate and receive rate
<b>Channel Frequency</b>	Shows the channel in use (1~14)
<b>Status</b>	Current connection status
<b>SSID</b>	The SSID of the wireless system.
<b>Network Type</b>	The type of network and the station currently connected are shown here. The options include : Infrastructure, Ad Hoc
<b>Power Save Mode</b>	The power save mode have three mode: Max, Min, None
<b>Associated AP MAC</b>	The MAC Address of associated AP
<b>Up Time</b>	Record life time

## 4.2.7 Statistics

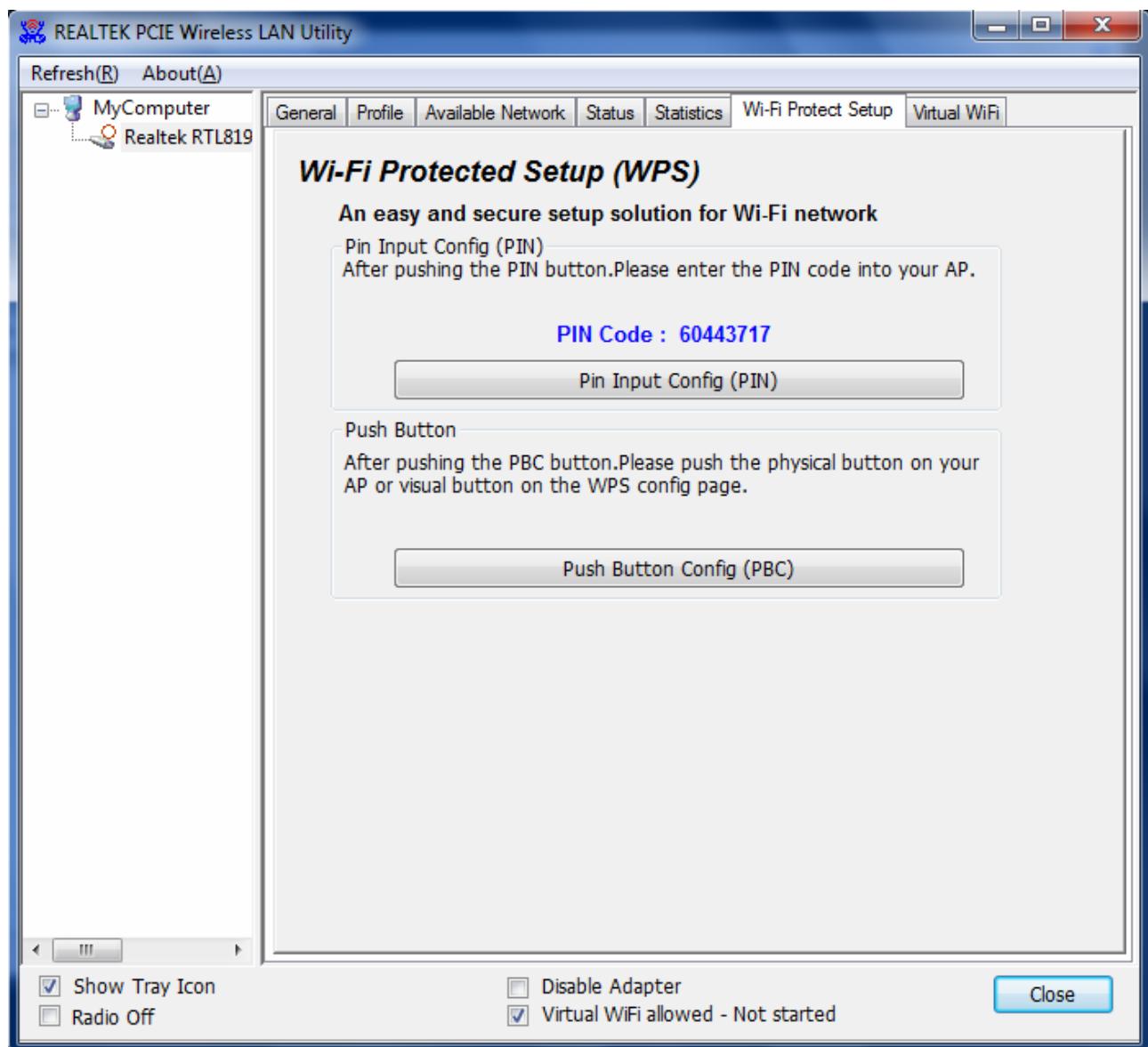
Statistics page displays the detail counter information based on 802.11 MIB counters. This page translates the MIB counters into a format to make the user easier to understand. It show receiving and transmitting statistical information about the following receiving and transmitting diagnostics for frames received by or transmitted to the wireless network adapter.

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Items	Information
<b>TX OK</b>	Successfully transmitted frames numbers.
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<b>RX OK</b>	Successfully received frames numbers.
<b>Rx Packet Count</b>	The packets of receiving frames
<b>RX Retry</b>	Frames numbers re-receiving
<b>RX ICV Error</b>	Integrity Check Value receiving with error.
<b>Reset Counter</b>	Reset counters to zero.

## 4.2.8 Wi-Fi Protect Setup



The primary goal of Wi-Fi Protected Setup (Wi-Fi Simple Configuration) is to simplify the security setup and management of Wi-Fi networks. This adapter supports the configuration setup using PIN configuration method or PBC configuration method. If the wireless card supports Wi-Fi Protected Setup (WPS), you can establish a wireless connection between wireless card and router using either Push Button Configuration (PBC) method or PIN method.

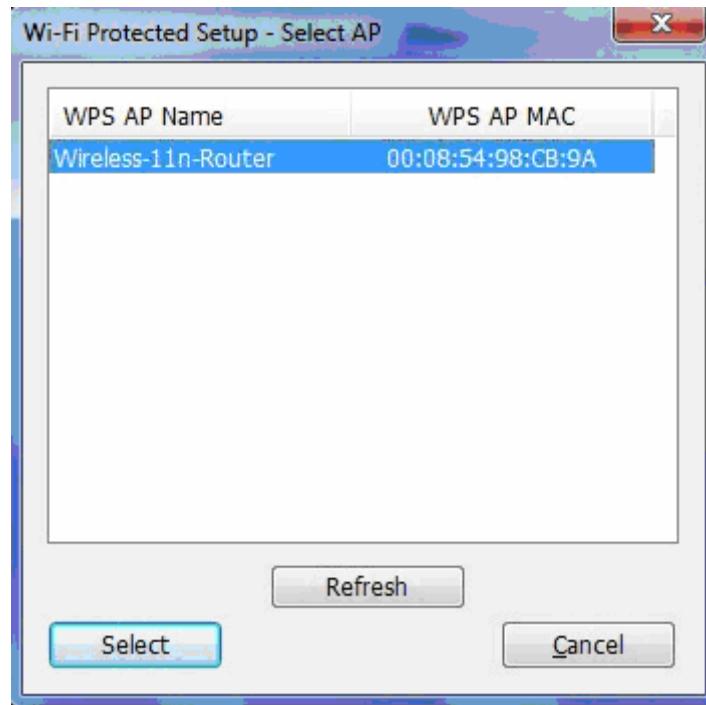
Here we will introduce two ways to configure the QSS

(QSS is known as rapid security settings, by pressing the wireless router and wireless card on the QSS button to automatically set up WPA2 secure connection level without the router or network adapter management software to conduct the cumbersome interface settings, greatly simplifying the operation of the wireless security settings.)

**Pin Code:** 8-digit numbers. It is randomly generated from system

## 2. PIN method

Click the button “Pin Input Config (PIN)”, and then come to a dialog box “Do you want to select a specific AP?”. Then click the button “Yes”, you can select one of the AP.



In this figure, you can operate these buttons “Refresh / Select / Cancel”. Select the name of the proper AP, and click “Select” button, you could use PIN method to configure the QSS.

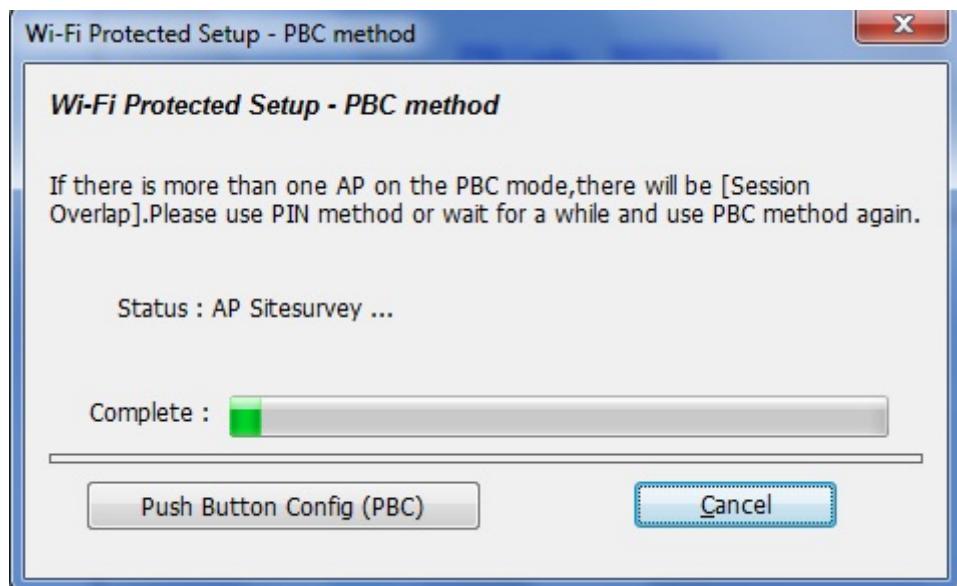


Double click the Internet WEB browser icon on your desktop screen. Type the IP address of you selected router/AP into the URL and press Enter, and then you can enter the configuration.

Please enter the WPS ( Wi-Fi ) configuration page, type the PIN code of adapter and click confirm button to build WPS connection. WPS connection will be successful by PIN method after several minutes.

## 2. PBC (Push Button Configuration) method

After pushing the PBC button, Please push the physical button on your AP or visual button on the WPS config page, then come to the following figure.

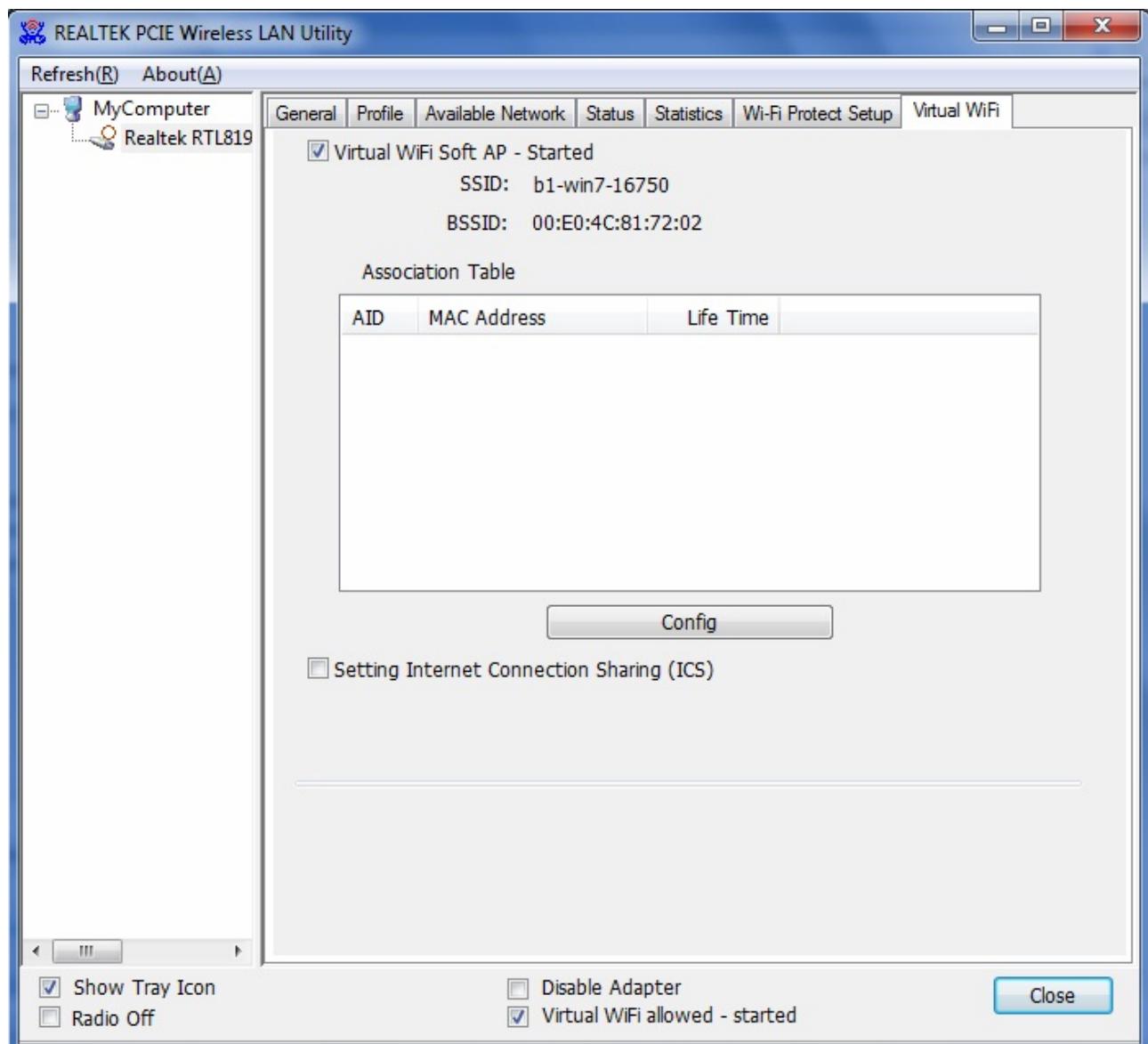


Please enter the WPS ( Wi-Fi ) configuration page of your desired router/AP, and then start PCB connection. WPS connection will be successful by PBC method after several minutes.

#### 4.2.9 Virtual WiFi

Virtual WiFi, abbreviated to VWiFi, is a software layer that abstracts the wireless LAN card hardware into multiple virtual adapters. The software handles the connections of each adapter to ensure every adapter has an opportunity to connect to their respective networks limited by time. And you act as if you have multiple WLAN hardware adapters working independently.

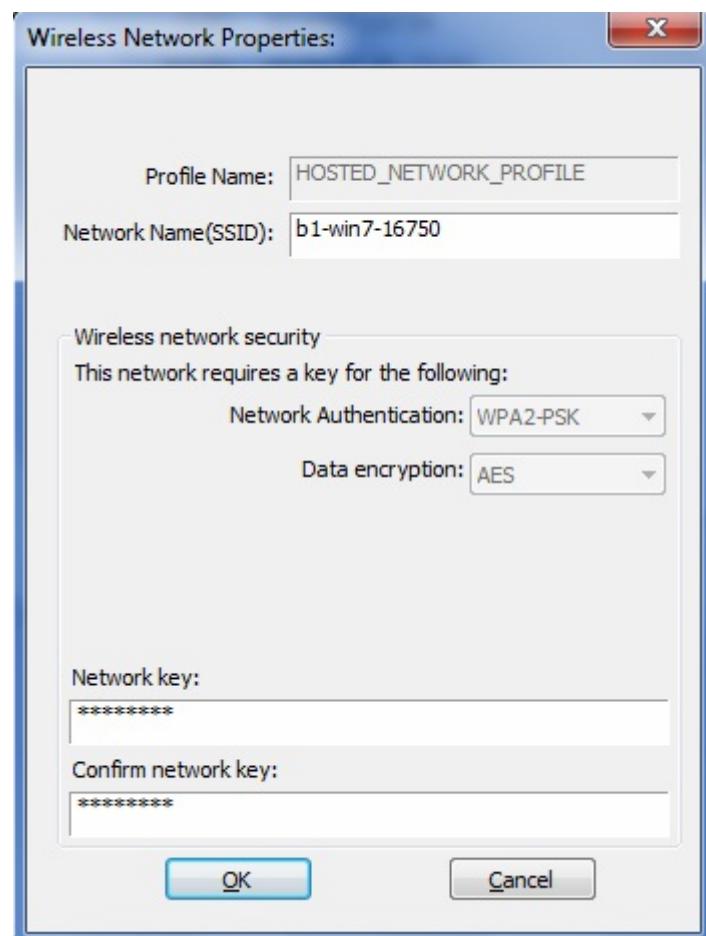
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Items	Information
<b>SSID</b>	The name of connected IEEE 802.11 wireless network. This field has a maximum limit of 32 characters.
<b>BSSID</b>	a locally administered MAC address of the wireless network generated from a 64-bit random number
<b>Association Table</b>	It is the list of joined stations to this adapter
<b>AID</b>	Association ID
<b>Mac Address</b>	It is the six two-digit numbers that assemble the MAC address of respected joined station
<b>Life time</b>	It is the timer that counts down from 10 minutes whenever the adapter connects the station successfully. If an STA associated to

	SW adapter does not have any interaction with the adapter in 10 minutes, it will be disassociated from the Infra-structure BSS
<b>config</b>	A dialog of this adapter is shown for configuration modification

Click config button and the network properties interface pops up. You can key in the network key to set up the security accessing authority and click OK to finish the configuration. The other connector can share the same network by typing in the network key. In this way the adapter realizes the function as a softAP.



## Appendix A: Specifications

### Standard

IEEE 802.11n draft 2.0, IEEE 802.11g, IEEE 802.11b, IEEE 802.3, IEEE 802.3u

### Interface

1\*Wireless 1T2R PCI-E Card ( PCI ExpressTM Base Specification Revision 1.1 )  
2\*reverse SMA detachable antennas (Standard 1.8dB)

### Receiver Sensitivity

300 Mbps Typical -68 dBm

54 Mbps Typical -73 dBm

11 Mbps Typical -84 dBm

### Channel

USA 11, Europe 13, Japan 14

### Transmit Power

16dBm typically @ 802.11b

14dBm typically @ 802.11g

13dBm typically @ 802.11n

### Network Data Rate

802.11b: 1,2,5.5 and 11Mbps

802.11g: 6,9,12,18,24,36,48 and 54Mbps

802.11n: up to 300Mbps

### Range Coverage

Indoor 35~100 meters

Outdoor 100~300 meters

### Temperature

Operating: 0°C ~ 40°C (32°~104°F)

Storage: -10°C ~ 70°C (14°~158°F)

### Humidity

Operating: 10% ~ 90% RH, non-condensing

Storage: 5%~90% RH, non-condensing

### Emission

FCC, CE, VCCI Class B

## Appendix B: Glossary

- **802.11b** - The 802.11b standard specifies a wireless product networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz, and WEP encryption for security. 802.11b networks are also referred to as Wi-Fi networks.
- **802.11g** - specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4GHz, and backward compatibility with IEEE 802.11b devices, and WEP encryption for security.
- **802.11n** - 802.11n builds upon previous 802.11 standards by adding MIMO (multiple-input multiple-output). MIMO uses multiple transmitter and receiver antennas to allow for increased data throughput via spatial multiplexing and increased range by exploiting the spatial diversity, perhaps through coding schemes like Alamouti coding. The Enhanced Wireless Consortium (EWC) was formed to help accelerate the IEEE 802.11n development process and promote a technology specification for interoperability of next-generation wireless local area networking (WLAN) products.
- **Ad-hoc Network** - An ad-hoc network is a group of computers, each with a Wireless Adapter, connected as an independent 802.11 wireless LAN. Ad-hoc wireless computers operate on a peer-to-peer basis, communicating directly with each other without the use of an access point. Ad-hoc mode is also referred to as an Independent Basic Service Set (IBSS) or as peer-to-peer mode, and is useful at a departmental scale or SOHO operation.
- **DSSS** - (Direct-Sequence Spread Spectrum) - DSSS generates a redundant bit pattern for all data transmitted. This bit pattern is called a chip (or chipping code). Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the receiver can recover the original data without the need of retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers. However, to an intended receiver (i.e. another wireless LAN endpoint), the DSSS signal is recognized as the only valid signal, and interference is inherently rejected (ignored).
- **FHSS** - (Frequency Hopping Spread Spectrum) - FHSS continuously changes (hops) the carrier frequency of a conventional carrier several times per second according to a pseudo-random set of channels. Because a fixed frequency is not used, and only the transmitter and receiver know the hop patterns, interception of FHSS is extremely difficult.
- **Infrastructure Network** - An infrastructure network is a group of computers or other devices, each with a Wireless Adapter, connected as an 802.11 wireless LAN. In infrastructure mode, the wireless devices communicate with each other and to a wired network by first going through an access point. An infrastructure wireless network connected to a wired network is referred to as a Basic Service Set (BSS). A set of two or more BSS in a single network is

referred to as an Extended Service Set (ESS). Infrastructure mode is useful at a corporation scale, or when it is necessary to connect the wired and wireless networks.

- **SSID** - A Service Set Identification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless Access Point and to the wireless network name. See also Wireless Network Name and ESSID.
- **WEP** - (Wired Equivalent Privacy) - A data privacy mechanism based on a 64-bit or 128-bit or 152-bit shared key algorithm, as described in the IEEE 802.11 standard. To gain access to a WEP network, you must know the key. The key is a string of characters that you create. When using WEP, you must determine the level of encryption. The type of encryption determines the key length. 128-bit encryption requires a longer key than 64-bit encryption. Keys are defined by entering in a string in HEX (hexadecimal - using characters 0-9, A-F) or ASCII (American Standard Code for Information Interchange – alphanumeric characters) format. ASCII format is provided so you can enter a string that is easier to remember. The ASCII string is converted to HEX for use over the network. Four keys can be defined so that you can change keys easily.
- **Wi-Fi** - A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see <http://www.wi-fi.net>), an industry standards group promoting interoperability among 802.11b devices.
- **WLAN** - (Wireless Local Area Network) - A group of computers and associated devices communicate with each other wirelessly, which network serving users are limited in a local area.
- **WPA** - (Wi-Fi Protected Access) - A wireless security protocol use TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server